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ABSTRACT

This book contains summaries of the presentations delivered at the first European Conference on Curriculum. Sponsored by the European Curriculum Researchers Network (ECUNET), the conference aimed to offer researchers an opportunity to present their findings and discuss them with research colleagues and other professionals interested in curriculum improvement. The book contains summaries from two sessions that review curriculum research and development in the following countries--England, Germany, The Netherlands, Israel, Romania, the Czech Republic, and Russia. Summaries of presentations on the following themes are also provided: curriculum implementation; mother-tongue curriculum; curriculum assessment and student outcomes; curriculum innovation and textbook development; curriculum development in different contexts; curriculum evaluation; quality assurance in assessment of student outcomes; curriculum policy; curriculum improvement and teacher development; and science and mathematics teacher professional development in Southern Africa. (LMI)

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European Research on Curriculum

Book of Summaries

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Editors

Jan van den Akker

Wilmad Kuiper

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European Research on Curriculum

Book of Summaries of the first
European Conference on Curriculum

August 31 - September 2, 1994
University of Twente, Enschede
The Netherlands

Editors
Jan van den Akker
Wilmad Kuiper

Colofon

Editors
Jan van den Akker
Wilmad Kuiper

Editorial Assistant
Irene Voerman

Print
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University of Twente
Faculty of Educational Science and Technology
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The Netherlands

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PREFACE by the Editors

This book contains the summaries of the presentations delivered at the first European Conference on Curriculum, organised at the University of Twente, Enschede, The Netherlands (August 31 - September 2, 1994).

During the first ECER meeting in June 1992 a proposal was put forward to start a European Curriculum Researchers Network (ECUNET). The positive response to this idea and a first ECUNET Newsletter in February 1993 has encouraged the initiators to continue their efforts with planning a first European conference on research in the field of curriculum. About 100 colleagues from 18 different countries have replied to the Call for Proposals, covering a wide range of curriculum themes.

The major aim of the conference is to offer researchers an opportunity to present their findings and discuss them with research colleagues and other professionals (e.g. in the domains of curriculum development and policy) who are interested in curriculum improvement.
Another important aim of the conference is to extend and intensify the co-operation within ECUNET. The most appropiate nature and organisation of this co-operation and future activities will partially depend on the structure and activities of the very recently founded European Educational Research Association (EERA) that will probably serve as an umbrella organisation for both the various national educational research associations and the different European research groups (associations, networks, and the like) that are focused on specific educational domains (like curriculum).

The presentations of this 1994 conference are scheduled in different formats:

- Country Lectures: reviewing (parts of) the state of the art in curriculum research and development in a number of specific countries;
- Paper Sessions: sets of single papers, clustered around a common theme; and
- Symposia: combined presentations on a common theme.

Altogether, the programme contains are two sessions with country lectures, eight paper sessions, and five symposia. The table of contents in the next pages provides an overview of all presentations.

This Book of Summaries has been produced before the conference and distributed at the beginning of the conference. It is foreseen that a selection of the full papers will be published afterwards.

Jan van den Akker & Wilmad Kuiper

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Courseware Development from an Implementation Perspective: Emphasis on the Teacher's Role

Paul Keursten
University of Twente, the Netherlands

Framework and research question

Central to the implementation of computers in education is the classroom teacher. Most teachers are still inexperienced in using computers in their classroom activities. In initial implementation stages small scale successful experiences in their own classroom practice are an important factor in stimulating further use of the innovation. These experiences help teachers in acquiring clarity about the meaning and potential of the innovation, in gaining confidence in their own competence, and in developing their own view of the appropriateness of the innovation for the students and themselves.

Our study is based on the assumption that such successful experiences in the initial implementation stage can only take place when teachers have high quality courseware (computer software and written (lesson) materials) at their disposal.

In this study we investigated which characteristics of courseware, especially teacher materials, contribute to successful implementation experiences in the initial implementation stage. In answering this question, we concentrated on teacher materials as a part of open ended courseware for lower secondary education.

Design of the study

The study consisted of two main stages. In the first stage, design guidelines for courseware materials were formulated, based on:

- an extensive analysis of research literature;
- three subsequent pilot projects, in which courseware was developed and tested.

In the second part of the study, we tested the effectiveness of these guidelines in a field experiment. In this experiment two versions of the same courseware (covering five geography lessons in lower secondary education) were compared: an experimental version, with teacher materials developed in accordance with the design guidelines, and a control version, with teacher materials similar to the kind of materials that were available from courseware publishers. We conducted the experiment with the cooperation of 37 geography teachers who were inexperienced computer users.

Data were gathered on three dimensions of successful implementation:

- teachers' perceptions, through a written questionnaire;
- lesson execution, through observations;
- learning results, through a written student test.

The observations were based on a profile, in which an "ideal" lesson was made operational by formulating "necessary", "positive" and "unacceptable" lesson activities. Based on this profile we were able to assign a numerical score to each lesson and to elements of the lesson.

Results of stage 1: Design guidelines

Summarizing the conclusions from the first stage, we can formulate two main design principles (which we elaborated into more specific design guidelines):

- Teacher materials should:
  - indicate clearly which elements of the courseware are essential for achieving the intended change and the desired learning outcomes, and which elements can be adapted without distorting the change;
  - contain very accurate how-to-do-it advice, focused on essential but apparently vulnerable elements of the courseware.
- When courseware developers provide detailed procedural advice, they should make sure that this advice is effective and validated. Therefore a careful development approach, with much attention for formative evaluation and revision of the materials, is needed.

In our attempt to support teachers through teacher manuals, we encountered two interrelated problems: teacher manuals are rarely used, and teachers have very little time available for lesson preparation. In our study we applied two solutions to these problems:

- providing a videotape with examples of the intended use of the courseware in actual classroom settings, that can function as an advance organizer;
- integrating teacher and student material, resulting in an extended version of the student materials, in which student texts and exercises are supplemented with practical suggestions for the teacher. This integration limits the number of courseware components the teacher has to deal with.

Results of stage 2: Testing of design guidelines

The field experiment yielded the following results:

- Teacher perceptions

  The experimental version of the teacher materials did not result in a more positive perception of teachers about the lessons: both conditions were fairly positive about the lessons and the materials in general. However, the two groups did differ in their opinion about the teacher guide: teachers using the experimental version were more positive.
- Lesson execution

  The lessons in the experimental group were more in accordance with the intentions of the developers than the lessons in the control group. Teachers using the experimental materials took better care of the introduction of the lesson and the discussion of the activities with the software at the end of the lesson.

  However, a mean score of 53% (on a scale from 0 to 100) in the experimental group, indicated that not only teachers in the control group (mean score: 38%) had difficulties in realizing an "ideal" lesson. This shows that there is still room for improvement in the experimental condition.

- Student learning
  Students in the experimental condition attained better results on the test than their peers in the control group. Their average score, on a scale from zero to ten, was almost one point higher than the average score in the control group.

Conclusion

The study showed that teacher material can serve as an important aid for teachers who are inexperienced in using the computer in their classroom. It is possible to stimulate a successful implementation of courseware, by anticipating implementation problems during the development of the (teacher) materials. The guidelines that were formulated in the first stage of our study have proven to be productive tools to do so.

However, the results also supported the well known fact that materials alone can never be the whole solution to the problems teachers face. The effects of the teacher materials were significant but limited. Additional support (e.g. in-service training and coaching) is needed to achieve lasting and successful change in classrooms.

P. Keursten
University of Twente
Faculty of Educational Science and Technology
P.O. Box 217
7500 AE Enschede
The Netherlands
Phone: +31 - 53 - 893551
Fax: +31 - 53 - 329136

Curriculum Materials as a Learning Device in Inservice Training

Marianne Roes
University of Twente, Enschede, the Netherlands

Introduction

From the implementation literature we know that materials development and inservice training are potentially very effective in supporting implementation efforts (Fullan, 1985). This paper reports about a study in which curriculum materials are used as a learning device in inservice training programs aimed at curriculum implementation. Curriculum materials are defined as exemplary packages of student and teacher materials that are ready for classroom use and clearly represent - in operational terms - the curriculum innovation.

Design of the study

The entire study consists of three phases: an exploratory, development and evaluation phase.

In the *exploratory* phase we have derived functions of curriculum materials in inservice training from knowledge about effective inservice training practices, especially the model of Joyce and Showers (1988). This model consists of theory, demonstration or modeling, practice, feedback and coaching. Curriculum materials can be used to fill in some of these components. Curriculum materials can have a demonstration function. By studying and analyzing the materials teachers can gain an understanding of the underlying ideas. This function can be enhanced by adding video-recordings of teachers actually working with the materials. Curriculum materials can also have a practice function. Teachers participating in the inservice training can gain some experience with the new teaching approach by carrying out the exemplary lessons in their classrooms. They can get feedback from and exchange experiences with the trainer and other participants working with the same materials.

In the *development* phase of the study these functions of curriculum materials are being operationalized in an inservice training program for mother tongue teachers and in an inservice training program for science teachers (both lower secondary education).

In the *evaluation* phase the effects of these inservice training programs on curriculum implementation will be studied.

This paper reports about the development and formative evaluation of the inservice training program for mother tongue teachers. The curriculum innovation concerns the teaching of communication skills (e.g. having formal conversations, discussions, listening skills, etcetera). To facilitate communication skills acquisition by pupils we have developed a model for structuring lessons. This model consists of four stages: orientation, preparation, execution and reflection. It is applied in a series of five lessons in which pupils learn to prepare and execute different kinds of formal dialogues. On the basis of a formative evaluation of these lessons, revisions have been made to enhance the practicality and effectiveness of the teacher and student materials.

These curriculum materials were the starting point for the development of an inservice training program on communication skills. This inservice training program consists of four, two-and-a-half hour sessions. During these sessions teachers analyze the exemplary curriculum materials and video-materials of teachers working with these materials. They also get background information on the new teaching approach. In between the sessions teachers carry out the lessons in their own classroom and keep a log of their experiences; they are stimulated to prepare, carry out and reflect on the lessons together with a colleague. Every session starts with reflection on the lessons that have been carried out.

This inservice training program has been tested in the period October 1993 - January 1994. Seventeen participants from three different schools have attended the course. Data on the practicality and effectiveness of the program have been gathered by means of observations of the inservice training sessions and questionnaires (before and after the program). Additional data focused on more long term effects will be gathered in June by means of lesson observations and interviews with a subset of the participants.

Results

The first results show that in general, the participants regard carrying out the exemplary lessons in their own classroom as part of the inservice training program, as useful. These experiences support the creation of an image of the new approach. The participants feel slightly positive about their ability to prepare and carry out lessons on the topic of formal dialogues. As far as lessons on related topics are concerned (e.g. monologue, group discussions), participants feel neither insufficiently nor sufficiently equipped. Every participant plans to use (some of) the ideas and/or materials in the future.

At the ECUNET conference, the entire results of the formative evaluation of this inservice training program will be presented.

M.G. Roes
University of Twente
Faculty of Educational Science and Technology
P.O. Box 217
7500 AE Enschede
The Netherlands
Phone: +31 - 53 - 893557
Fax: +31 - 53 - 329136

Teachers as Curriculum Interpreters: the Science Case

Ellen van den Berg
University of Twente, the Netherlands

Introduction

'The heart of teaching is curriculum making' (Ben-Peretz, 1993). Nobody will deny that it is the work of the teacher to bring to live and bring live to curriculum vision (cf Bolin, 1987). The issue becomes problematic in defining the role of the teacher in curriculum development for innovations. Two extreme roles can be distinguished:

- teachers using teacher proof materials;
- teachers as curriculum developers.

In her work Ben-Peretz (1990) tries to overcome the extreme dominance of either curriculum or teacher in favour of a more equitable arrangement. Building on her work with Connelly (Connelly & Ben-Peretz, 1980), she advocates a point of view in which teachers transform curriculum materials according to their specific educational situation by analyzing, criticizing and modifying curriculum materials. It is a major challenge for pre-service and in-service education to provide teachers the skills and the motivation to do so. According to this approach curriculum materials are a source for educational change and not a tool or framework for classroom teaching. In creating curricula, inspired by existing materials, teachers develop a kind of 'ownership' with the change proposal which might benefit the implementation process. But this mutual adaptation approach carries the risk that adaptations made by teachers cause distortions destroying the spirit and meaning of the curriculum implemented in the classroom (cf. Prawat, 1993). Especially in implementing science education which stresses upon guided discovery learning this danger is not imaginary, because the quality of curriculum adaptation depends highly upon the pedagogical content knowledge (the professional blending of content and pedagogy which enables teachers to organize and adapt teaching topics to diverse student populations (Shulman, 1987). Exactly the lack of pedagogical content knowledge is one of the major problems in implementing elementary science (cf. Tilgner, 1990).

Taking into account the fact that beginning teachers lack knowledge, skills and experience to teach without the support of teacher guides and textbooks, Loewenberg-Ball and Freiman-Nemser (1988) argue that teacher educators should learn beginning teachers how to learn from published curriculum materials. They state that 'teaching well even from a highly prescriptive curriculum is also more complicated than many of us seem to appreciate'. In his article 'The Teacher as Learner in Curriculum Implementation' Van den Akker (1988) shows that teacher guidelines with accurate how-to-do advice lead to teacher behavior which is much more according to the intentions of the designers than more open suggestions.

The aim of this paper is exploring the effect of using curriculum materials in an inservice training for elementary teachers.

Methodology

Based upon the work of Joyce and Showers (1988) and of Yeany and Padilla (1986), an inservice teacher training in elementary science education has been designed and evaluated (Van den Berg, 1993). In this training curriculum materials played an important role in demonstrating the underlying principles of hands-on science, and serving as a tool for analyzing science lessons, micro-teaching and teaching in real classroom settings.

In this paper we will report about the lessons in real classroom settings in which the teachers act as curriculum interpreters. Both qualitative and quantitative data gathering techniques are applied.

Main conclusions

- Giving a lesson as part of the training program had a very positive effect on the motivation of the teachers. Especially the entnusiasm of the students was experienced as surprising and stimulating.

- The majority of the teachers can be classified as 'learners from the curriculum materials'; they implemented the lesson according to the guidelines given. Only one teacher acted as a critical modifier of the curriculum materials. He transformed the guidelines in a way that better fitted with his teaching style and his perception of the needs of the students.

- An experiment in which half of the teachers received open teacher guidelines (group 1) and the other semi-structured ones (group 2) leads to the following main conclusions:
  - The more structured version reduces preparation time which might enhance science implementation, because the time consuming lesson preparation is one reason avoiding science teaching.
  - Teachers using the open materials were more active in designing their own lesson. In some cases this resulted in creative lessons within the boundaries of the intentions of the innovation. In other cases adaptations were made which resulted in more teacher-centred lessons, in which students were not allowed to explore the materials in their own way and not stimulated finding solutions for their problems themselves.
  - Most teachers preferred the structured version because, among others, it reduces uncertainty about the forthcoming lesson and gave them support in learning a new teaching approach.
  - Only a minority of teachers could create, with the help of open suggestions, a lesson in accordance with the intentions of innovative science.

E. van den Berg
University of Twente
Faculty of Educational Science and Technology
P.O. Box 217
7500 AE Enschede
The Netherlands
Phone: +31 - 53- 893764
Fax: +31 - 53 - 329136

Strategy, Chance Hits and Missers
in the Development and Innovation of the New Mathematics Curriculum for the Age Group 12-16 in the Netherlands

Marja Meeder
APS, the Netherlands

George Schoemaker
Freudenthal Institute, the Netherlands

Period of development and starting dissemination

- The development of the new curriculum took place in the period '87 to '92. There were many political constraints in creating possibilities for dissemination. The government gave order to compose a new curriculum, but no money for the necessary dissemination was available during that period. We were disobedient in that effect but of course the money was taken from the curriculum project.
- The demands of mathematics education for girls should be met: Applicability and relevance for the students further life.
- A new curriculum respecting the problems of students to whom Dutch is a second or third language: Contrary to the use of contexts?
- The role of experimenting schools. How many do you need for legitimation? How many at a time can you handle?
- The role of the experimental standardised national examinations: Far beyond a necessary service for the experimenting schools.
- The role of a union of mathematics teachers in the infrastructure, necessary for an early exchange of ideas with teachers.
- The cooperation with the publishers. They have to take big financial risks. They need information, we need new schoolbooks representing the new curriculum and on time.

The period of dissemination and some ongoing developments

- The dissemination started before the end of the developing project because of an existing strong infrastructure. Officially it started in 1992.
- The advantages and disadvantages of a general change in education (*basisvorming*) in the same year of the new curriculum in the schools. It was important to be in fase with a general change in organization and content of the school in the age group for 12 to 16.
- The eternal struggle about the central exams. How can be achieved that the ideas of the new curriculum are reflected in the new experimental exams? An independent group of teachers should be able to design exams according to the new curriculum. It takes time to build up expertise in such a group to design balanced exams fitting in the new curriculum and related to the practice in the experimenting schools. What should be the influence of the developers of the new programs and the experimenting schools in this process?

The methodology of research, development and dissemination

- The COW (a group of people representing different groups in the educational, mathematical landscape) designed a plan. But the way of execution of the plan was open for changes depending of the experiences during the process.
- We did not choose for a model with a small number of schools and testing of the results on those schools in a comparative way with other schools. Even if we would have had this possibility- in the case that there would have been more time for research and development and a longer period for dissemination- this way would not have been chosen.
- The responsible committee (COW) decided to develop in an open way and to pay attention to innovational aspects from the start of the project. Because of former experiences and an existing infrastructure an open model was chosen.
- Originally the legitimation of the new curriculum should have take place through working on a large number of schools with the new curriculum during the five years. Gradually this idea changed to more emphasis on the democratic aspect of open development and cooperation with many experts of teacher education, teacher league and authors of schoolbooks and less on the aspect of a large number of schools as a mean of legitimation of the new programme.

G. Schoemaker
University of Utrecht
Freudenthal Institute
Tiberdreef 4
3561 GG Utrecht
The Netherlands
Phone: +31 - 30 - 611611
Fax: +31 - 30 - 660430

Mother Tongue Curriculum in Europe: Current Trends and Prospects. An Introduction

Chair: Alexandru Crisan
Institute for Educational Sciences, Romania

Context

Mother Tongue Education (MTE) is a central concern of any educational system in the world. This fact has, in essence, scientific or political explanations. Of course, from the scientific point of view, the teaching of Mother Tongue (MT) in school is generally considered to be one of the fundamental means of education of the youth, through the development of their communicative competence as well as their understanding the system of values, the traditions and outlooks specific to the community which they belong to.

The research question of the Symposium

Within such a context, without neglecting the educational policy implications of this domain, the role of the research in MT curriculum development would be to bring the problem back into the field of educational sciences. This is, as a matter of fact, what the present Symposium aims at: to pass - in changing perspective - from the question where and why are different MTs taught, to the question how their study is conceived, at the level of the national curriculum in some European countries.

Beside its novelty; the comparative approach of the latter aspect is important from at least the following points of view:

- by studying the problems of MT curriculum development, it approaches an educational reality of a cross-curricular and metà-cognitive type, having a significant influence on the educational process as a whole; in fact it is well-known that a good proficiency of the MT is the basis of all the pupils' cognitive and affective acquisitions, being thus a "corner stone" in the structuring of their personalities;
- the Symposium could also bring additional information concerning the concrete realization of MT curriculum development, in very different educational systems; thus, it will lead to the outlining of some constructs, relevant for the management of MT learning situations, in general;
- the results of the Symposium could be a basis for the elaboration in the future, of some modules of a flexible and optimal organization of MT curriculum development, as well as for the solving, on scientific grounds, of some linguistic realities with political implications (minorities' MTs; multilingualism etc.).

The state of the art

In present-day MTE and curriculum development there are, essentially, two types of approaches.

The first one promotes an one-lingual view, being mainly concerned with the research of the evolution and present state of a certain MT teaching and learning. As a matter of fact, in all European countries, there is a rich tradition in this respect, focussed on what we can call "the pedagogy of MT".

A second type of approach, a more recent one, choses comparative researches concerning the pedagogical aspects of MT teaching in different countries. In spite of some remarkable efforts, these investigations haven't been able to offer, for the time being, an overall synthesis of the issues in discussion; they are mere comparisons of isolated components of the system which is and has to be MTE and curriculum development. Thus, also from this point of view, the present Symposium could fill in a gap, not at all to be neglected, in the bibliography of this domain.

Aims of the Symposium

Starting from the statements above, the present Symposium aims at drawing up a comparative analysis of MT curriculum development in Europe. Concretely, we will have in view:

- the examination and comparison of the place of MTE in the curriculum of different European countries; in this context, our interest will lie not only in MTs which are, at the same time, official languages, but also the languages of different national minorities;
- the comparative research of the pedagogical and educational contents of the didactic paradigms on which MT curriculum in Europe is based;
- the comparison of different types of educational actions used in the classroom (pedagogy, methodology, the management of the learning situation etc.).

On the whole, we will be interested in the derivation of some constant elements from compared concrete cases, which should be able to outline a "fresh", active and dynamic model of MT curriculum, thoroughly adapted to the demands of present society.

Our discussions will exclusively focus on the compulsory schooling. We start from the fact that - almost in every European country - this is considered to be the level at which the basic linguistic education, which is so necessary for the future social insertion of youth, is provided.

Format of Presentations

In order to reach the objectives and answer the questions posed in the Symposium, the presentations will deal with a relatively vast area of issues, organized in three compartments. We will present them, as follows, and reveal the main aspects which they will emphasize. This format has been, of course, optional; every presenter has organized his/her paper differently, respecting only the general framework offered in these pages.

The first part

The first compartment of the presentations is supposed to refer to the position and relevance of MTE within the national curriculum of the country under discussion.

On the one hand, one will take as a starting point the structure of the compulsory education in the country presented. On the other hand, the presentations will have in view the organization of the school curriculum for primary and secondary education (the main subject-matters, different ways of grouping them in educational areas, the relationship between compulsory, facultative or optional subject matters etc.). On this basis, a chapter concerning the place and percentage of MTE within the curriculum will be worked out.

The approach will be more useful the more it will be able to offer a rigourous system of reference for any other future discussion concerning the role of MTE in compulsory school curriculum.

The second part

The second compartment will focus on the dominant didactic paradigm promoted in the framework of the MT curriculum. It will investigate two areas of the issue.

Firstly, we will give our attention to the administrative aspects of organizing MT curriculum development. In this framework the presentations will deal with the nature and role of the main school documents regulating MT teaching in different countries ("National curricula", "programmes of study" etc.).

Then, we will analyze the type of institutions and "decision making" functioning in the domain we are interested in. The hypothesis we wish to support is that the decentralization of the decision making process, on the one hand, and the prevalence of the scientific decisions over the political ones, on the other one, can but contribute to the improvement of MT teaching, including those of the minorities.

Secondly, the pedagogical (educational) issues of the didactic paradigm will be dealt with more thoroughly. In this context the following issues seem to be important:

- the nature of the didactic paradigm (descriptive/prescriptive, communicative/non-communicative; information-centred/competence-centred; functional/non-functional etc.);
- the structuring of the didactic paradigm (either on the basis of artificial segmentation into "language" and "literature", or starting from skills like listening, speaking, writing and reading, involved in the use of language);
- the components of the didactic paradigm.

The latter ones are, in essence, the followings:

- the "adjusting" component, consisting of different types of finalities goals, objectives (general and specific ones), as well as attainment targets, all being able to regulate MT teaching;
- the "content" component, including different modalities of structuring - in modules, chapters etc. - the concrete teaching material; these chapters involve phonetics, vocabulary, grammar, orthopy, orthography and punctuation (as far as "language" is concerned), but also different kinds of texts, knowledge of literary theory and rhetorics (as far as "literature" is concerned); to this one can add "compositions" as well as some elements concerning "oral communication";

- the "assessment and evaluation" component, covering the whole range of materials used for evaluating the level of attainment of school performances.

Having in view all these aspects, the presentations will shortly examine, on this basis, also the types of textbooks and support materials used in the MT teaching/learning process in Europe. Without these, the image of the didactic paradigm could not be complete.

The third part

The third part of the papers are supposed to refer to the system of didactic activities in MTE. In this framework, the types of didactic strategies used by teachers in the MT classroom will be analyzed. A special attention will be given to the interactive methods through which the refining of the pupils' communicative competence can be encouraged, as well as their capacity to adapt themselves to the demands of the society.

Expected Outcomes

We consider that the relevance of this Symposium lies in at least two elements:

- the novelty of the topic: the research of the modalities to ensure MT curriculum in European countries, minorities' languages including;
- the adopting of a comparative, inter- and cross-cultural outlook, meant to outline the similarities and differences among several "didactic paradigms".

Given these facts, two outcomes are expected:

- On a short term, the thorough description of the main solutions and trends in current MT curriculum development in Europe; such a description could be a system of reference, extremely useful for any process of remodelling MT teaching, irrespective of the country where this may occur;
- On a long term, the building up of a clear and at the same time, flexible MT curriculum model, thoroughly adapted to the demands of future society. Such a model could have significant implications also at the level of educational sciences, as a whole. And this, starting from the fact, that MT communication competences belong to the category of transversal competences (cross-curricular) without which no educational acquisition can be conceived.

A. Crisan
Institute for Educational Sciences
37 Stirbei Voda
70732 Bucharest
Romania
Phone: +40 - 0 - 16136491
Fax: +40 - 0 - 13121447

Mother Tongue Education and the Acquisition of Dutch as a Second Language

Helge Bonset & Theun Meestringa
National Institute for Curriculum Development (SLO), The Netherlands

Now that IMEN has delivered several comparative descriptions of MTE in different European countries one has to consider the inevitably innovative aspects of curriculum development. In order to come to an overall synthesis of MTE we propose to focus on the new demands on the subject with which teachers have to cope. Due to the international mobility of the past few decades, MTE in the traditional, pure sense has gradually become obsolete. In every (European) country teachers are confronted with pupils with diverse cultural and linguistic backgrounds. In the Netherlands this insight has received much interest, too. One of the main questions of curriculum developers is now how to adjust the 'Mother Tongue' curriculum in elementary and secondary education in order to serve all the pupils, including the multilingual ones.

In our presentation we will discuss the background, the state of the art and the proposed procedures to this curriculum reform in secondary education (for children of approximately twelve to fifteen years old). In doing so, we will have to make some remarks on the structure of compulsory education, the attainment targets and the nature and structure of prevailing paradigms of MTE in the Netherlands.

We shall clarify the need for integration of first and second language education and describe the state of the art in both fields which until now have been quite autonomous in the Netherlands. Different networks have been established of researchers, material and curriculum developers (in-service) teacher trainer for DFL and DSL, because of their respective target pupils, the dissimilar goals and objectives and the (recent) history of the study of second language acquisition. But after special newcomer classes, allochtonous pupils are soon integrated in the regular Dutch classrooms, and it is increasingly becoming clear that their ongoing (second) language acquisition has to be a concern of teachers during the pupils' entire educational career.

Looking for the best ways to adjust and renew the curriculum for the Dutch language one has to link up with the changes in the current paradigms of the teachers. For the first time in twenty years teaching practice in secondary education is undergoing a substantial change. This is caused by attainment targets laid down by the government for all compulsory subjects. For Dutch this has led to a shift from the study of the language system to language use. The elaboration of the attainment targets in language tasks in the curriculum for Dutch does not differentiate between first and advanced second language learners. The curriculum does not take into account the fact that in secondary education children's language acquisition has not been completed yet. For an integration of DFL and DSL it is necessary to analyze the language tasks with respect to all domains of communicative competence. This can lead to a branch on language learning into the curriculum.

This additional interpretation of the objectives must be implemented into classroom practice. Therefore, a teacher must be capable of using additional tools. To cope with more heterogeneous classes the teacher has to anticipate on a situation, in which there are more autonomous language learners, give finely tuned feedback to the pupils and create more possibilities for interaction and cooperation. This means that curriculum development must have a follow-up in the development of instructional materials and (in-service) teacher training.

In our contribution to the conference we will illustrate these points. We are aware of the fact that our key questions are important in other European countries as well.

H. Bonset
Institute for Curriculum Development
P.O. Box 2041
7500 CA Enschede
The Netherlands
Phone: +31 - 53 - 840840
Fax: +31 - 53 - 307652

Th. Meestringa
Institute for Curriculum Development
P.O. Box 2041
7500 CA Enschede
The Netherlands
Phone: +31 - 53 - 840559

Mother Tongue Curriculum in Romania

Matei Cerkez
Institute for Educational Sciences, Romania

The mother tongue is one of the most important issues of the education in any modern country, as it represents the basis of the intellectual, affective, social, etc. development of the individual. Therefore, its importance as an object of study in itself, the mother tongue ensures the coherence and progress inside the school curriculum taken as a whole.

The mother tongue represents a fact in itself evolving with society. That is why, in the whole, the traditional method for teaching the mother tongue is obsolete. The pupils in the schools today have a different linguistic and cultural background, they belong to different social groups and have different interests and requirements. Therefore, the need rises of a new curricular approach.

The curriculum reform in Romania started from the hypothesis that the decentralization and consideration of the epistemology, pedagogy, and sociology as resources of curriculum and not of the political life will have an essential contribution to the improvement of the mother tongue education both as national language and as the language of the minority communities.

The present paper reports on the present stage of the curriculum reform draft in the mother tongue education in Romania and the new attainment targets proposed for studying the Romanian language.

The programme drafts include the development of the awareness abilities by the pupils of the language structures and of their usage.

The study of the mother tongue in the Romanian education will have to be based on a communication model and will have the following objectives:

- Forming of a system of attitudes, values, and behaviours;
- Forming of an ensemble of lasting knowledge;
- Forming of some basic abilities (correct oral and written communication);
- Forming of some basic intellectual abilities (improvement of the thinking process, development of the personal creativity, etc.).

Therefore, an inventory is necessary of all the tasks the language should have with respect to the fields of the communication competence.

M. Cerkez
Institute of Educational Sciences
Curriculum Development Department
37 Stirbei Voda
70732 Bucharest
Romania
Phone: +40 - 1 - 6136491
Fax: +40 - 1 - 3121447

Merging or Yielding? The Roads of German Mother Tongue Education after the Unification

Wilfried Hartmann
University of Hamburg, Germany

After the unification of the two Germanies two systems of mother tongue education, structured in totally different ways, met and had to come to terms: a centralised and coordinated system in the GDR, with a common set of curricula, syllabi, and textbooks, backed by officially approved standard books on methods and professional journals - a decentralised system in the Federal Republic, influenced on the state level by ministries with different political party backgrounds, using textbooks published under economical aspects, commented by didactical and methodological publications, mirroring nothing but the individual authors conviction.

By analysing material from both systems before and after the unification as well as questionnaires filled in by teachers and students in connection with IEA and related studies the hypothesis is offered and illustrated by examples from different areas of our subject that remarkable results on the field of mother tongue education achieved in the former GDR are endangered by an un-reflected imitation of West German models.

W. Hartmann
University of Hamburg
Inst. for Comparative Education
Von Melle Park 8
D-20146 Hamburg
Germany
Phone: +49 - 40- 4123 - 2136
Fax: +49 - 40 - 4123 - 2112

Mother Tongue Curriculum in Finland: from Language Skills to Functional Literacy and Cultural Identity

Pirjo Linnakylä,
University of Jyväskylä, Finland

Current trends and prospects of curriculum development in Finland

In Finland, the current trends and prospects of the mother tongue curriculum in the comprehensive school reflect the same trends as the entire new curriculum which has been implemented since 1994. The new curriculum implies the *changing context* of the Finnish education and the recent views in the *conception of learning* and in the *conception of curriculum*.

Finland has undergone fundamental changes in the structure of economy, urbanization and technological development during the last few decades. Increasing internationalization is also typical of the present-day development in Finland. Cultural and economic interaction will grow and expand to cover more and more countries. Success in international markets requires advanced technical, economic and multicultural know-how. The explosive growth of information dissemination as well as studying and working abroad have increased the knowledge of different peoples and cultures. This makes Finnish culture more diversified and requires revision of traditional views. Knowledge of different cultures and many-sided language proficiency gain importance. Moreover, the importance of national identity and language are found anew.

It is typical of Finnish social development that *centralization decreases*. In the school world this is manifested through the fact that the decision-making power is increasingly entrusted to schools. The increased power of the schools to allocate their resources by themselves and to plan the timetable that emphasizes options offer true opportunities to the schools to concentrate on special competences. The students are also given a chance to study according to their *individual programmes*.

The *constructivist* conception of learning, which is to great extent applied in the new curriculum, emphasizes students' active role in the construction of their own knowledge and view of life. The students' attitudes, experiences and expectations direct where they focus their attention, what information they select, and what interpretation and meaning they construct. This means that the role of the teacher changes into a guide and designer of learning situations.

Learning to know what constitutes knowledge also includes a *critical attitude* towards knowledge and its truth. The school should, alongside with the traditional "teaching to know", guide students to examine and apply knowledge critically when solving various problems in practical situations. Efficient learning requires connections that cross subject boundaries, and more systematic joint planning than before in the creation of learning environment.

The construction of a curriculum is seen as a dynamic process. The curriculum must be continually revised. National objectives and development targets are defined to form the framework for the construction of *school curricula*. The purpose of the objectives is to give a direction, but they must not shackle the schools and not present too simplified a version of reality. It is left to the schools and teachers to define the specific objectives and choose the means to reach them. School-based curriculum work is an important instrument in developing education in practice and the teacher is increasingly a developer of his/her work. The teachers' personal involvement in the construction of curriculum is a prerequisite for any real change. Cooperation with the community is also important. This means that the school develops into an open *learning centre* with services of high quality.

The Finnish school system gives *comprehensive general education* to every child for 9 years from the age of 7 to the age of 16. The school is open 190 days per year, at the primary level on average 5 schoolhours per day, at the lower secondary level 6 hours per day. Time allocated for mother tongue is during the first two primary grades 25 % of instruction, during the other primary grades about 20 % and at the lower secondary level only about 10% of the total instructional time (IEA Reading Literacy Study, 1991).

The allocation of time for various subjects has been prescribed by the government but it determines only the minimum amount of time for the various subjects in a student's programme. The *upper limit is not determined.* Each school can decide and define its own profile by the amount of time allocated for special subjects, courses or cross-curricular topics. The fragmentation of the school curriculum into isolated subjects is experienced problematic. At the primary level the entire instruction can be integrated into cross-curricular modules to highlight various true to life topics, e.g. education for international understanding, new technologies, media and communication, environmental studies, and business education. At the lower secondary level the instruction can be organized subject-wise or in integrated course-units.

Paradigm shift in mother tongue education

In Finnish schools, the mother tongue may be Finnish, Swedish, Saame (Lappish), or some foreign language. Finnish and Swedish are official languages. The majority (94 %) of people in Finland speaks Finnish. Swedish is spoken by 6 %. The Swedish-speaking Finns are mainly bilingual. Since all social services are available also in Swedish, the Swedish-speaking students are entitled to education in Swedish at all levels of the school system. Thus Finnish- and Swedish-speaking children attend separate schools from kindergarten to university. The Swedish schools have become cornerstones for the continuous existence of the Swedish-language culture in Finland.

If Saame or some foreign language is the student's mother tongue, Finnish or Swedish is also taught beside the student's home language.

In the curriculum, mother tongue is defined *functionally* as an important instrument in mastering one's own life and building one's own identity. Thinking, self-expression, learning, social interaction, and enculturation are specified as the main functions of mother tongue. The instruction of mother tongue aims at functional literacy and cultural identity. From the perspective of curriculum development during the last decades, there has been a change from emphasis of language skills, norms and grammatical knowledge toward the functional literacy and communicative language competence and toward the awareness and appreciation of cultural and linguistic identity.

From the perspective of didactic paradigm, Finnish mother tongue education has experienced during the last decade a clear shift from the behavioristic information transfer model toward the more *cognitive/constructivist* approach and recently toward the *socio-constructivist* view of language learning and instruction. When constructivism emphasizes a process-oriented learning, where learner is an active agent who reflects his/her own experiences and needs, socio-constructivism emphasizes meaning construction through social experience and interaction. The learner generates meaning by using a variety of socially and culturally shared knowledge. In the socio-constructivist teaching, assisted instruction, student-teacher dialogue and students' co-operation are emphasized. The gradual release of responsibility moves toward a period of cooperation and joint responsibility, and ends with the students assuming control over their learning.

Mother tongue as a school subject includes the components of skills, knowledge, and art. It receives its contents from many different disciplines: from linguistic and literature studies, from communication sciences, from the study of reading and writing, and from the research on culture. The goal of instruction is, however, to obtain the best possible *internal integration* that also takes into consideration the various domains of language use - listening, speaking, reading, and writing - as well as integration of mother tongue with other school subjects.

In the new curriculum of the Finnish comprehensive school, the instructional aims and activities are supposed to be designed to match an *individual student's* interests, experiences, and strategies as well as to exploit a student's strengths to develop thoughtful, self-confident, and critical language use in different functional and cultural contexts. The main objectives of mother tongue education are to enhance the students' personal growth, self-esteem and willingness to communicate as well as to develop students' knowledge and skills needed in functional communication: speaking, reading and writing. In this context the awareness of and personal interest in language are supposed to grow. Through literature, theatre, media, and social interaction, students are supposed to acquire a basis for emotional and cultural development to strengthen their *Finnish (or Swedish-speaking Finns') identity* and also to accept and understand other cultures and languages as well as *multiculturalism* as a basic value.

P.L. Linnakylä
University of Jyväskylä
Institute for Educational Research
Seminaarinkatu 15
40100 Jyväskylä
Finland
Phone: +358 - 41 - 601211
Fax: +358 - 41 - 603201

Gaelic and the Curriculum in the Scottish Education System

Morag MacNeil
Leirsinn Research Centre for Gaelic, United Kingdom

This paper outlines the current official status of Gaelic as both a language medium for the curriculum, and as a subject on the curriculum. The position in the primary and secondary sectors of the education system is represented, and differences are explored between how Gaelic is taught as both first and second language.

Such information is presented in terms of how the current status represents major shift from the position in the last few decades and in relation to future expectations and developments. An outline of the establishment and expansion of Gaelic Medium Units helps to complete the background context, as does an overview of the implementation of the Scottish Office Education Department National Guidelines for Curriculum and Assessment for the 5 - 14 age group.

Models for curriculum delivery in Gaelic Medium Units are described, with a particular focus on methods used within the immersion stages, for language development, and for addressing the range of subject areas within the curriculum. The views of teachers and parents who have had considerable experience of this particular educational provision are described, with an analyses of the strengths and weaknesses of this provision, in its current phase.

M. MacNeil
Leirsinn Research Centre for Gaelic
Sabhal Mor Ostaig, Gaelic College
Sleat
Isle of Skye IV44 8RQ
United Kingdom
Phone: +44 - 4714 - 288
Fax: +44 - 4717 - 368

The Scottish Language Project: Struggling against History

Robbie Robertson
Scottish Consultative Council on the Curriculum, United Kingdom

Central problem/questions

Introduction

Scots, a version of the West Germanic branch of the Indo European family of languages, is one of three languages in use in Scotland; the others are English and Gaelic. It is a language recognised by the European Bureau of Lesser Used Languages. For the past three centuries, for a variety of reasons, it has been increasingly neglected within mainstream culture, especially within the school curriculum. It is, however, still spoken widely and has a literature, ancient and modern, of some distinction. It is currently going through a form of revival.

Some key questions

- Against the background, how should Scots best be promoted in the school curriculum? (Teachers lack expertise; parents - including those who themselves speak Scots - may be hostile; there has been little work done on Scots at the level of pre-service training; the language curriculum is itself already densely packed; and there are few resources for its promotion).
- What advantages are there for pupils in being given an awareness of the language? (The national examination structure for pupils agreed 15+ accommodates Scots but as an option within the examinations for English. It is also a feature of the guidelines on the language curriculum for children aged between 5 and 14 years.)
- What are the reactions of schools to this innovation? (On the whole positive).

Methods of analysis

The analysis was informal. I share a responsibility for reviewing the curriculum and also developing curricular advice and guidance (the Scottish curriculum is nonstatutory), as well as support materials for schools both primary and secondary. My work takes me to every part of Scotland and I meet regularly with providers at many different levels - senior management within schools and authorities, the tertiary sector, as well as teachers. My analysis of the issue stems from these discussion and my own experience.

The ultimate proposal for action, The Scottish Language Project, is a partnership between all the education authorities in Scotland and the Scottish Consultative Council on the Curriculum to produce materials for use in primary and secondary schools. It is the largest initiative ever taken in Scotland for the promotion of Scots in schools and its materials are currently being developed. Twenty four schools were surveyed across Scotland by means of telephone and personal interviews to gauge the feasibility of the Project. Their responses were uniformly positive.

Main results

The Scottish Language Project suggests a generic approach to the place and development of a lesser used language within the curriculum.

It addresses difficulties presented by matters such as: lack of familiarity, cultural neglect, past failures to respond to the language in official declarations on curriculum, difficulties within the parental group, issues concerning methodology and in particular pedagogy, lack of pre-service training. The issues to which the Project relates transcend curriculum, and concern, for example, national identity, the place of heritage in an evolving culture, the construction of meanings. Its approach is inclusive. It is not related to nationalist movements and welcomes the development of pluralist societies within a pan-European context.

Currently being developed are an anthology of Scots (and Gaelic in translation) together with a box of associated materials. Each of the anthology's major texts - poetry, prose (fiction and non-fiction) and drama - as well as photographs, comic strips, art works, etc. will be associated with a four page A4 pamphlet containing activities for pupils of different abilities, as well as information on the text, its authorship, contexts and metacontexts, assessment information and advice, and other guidance intended for teachers.

The box will also contain: audio tapes of readings of each of the print texts in the anthology, a dictionary of Scots/English/Scots intended for children, a booklet of guidance for teachers and wall charts and other materials showing the histories and the current distribution of Scotland's historically indigenous languages. There will also be a range of broadcasting in support of the Project by the BBC. The authorities will be providing a range of different tuition programmes on the Project.

The Scottish Language Project is an example of research in action and one likely to have a decisive effect on the curriculum of Language in Scotland.

R. Robertson
Scottish Consultative Council on the Curriculum
Gardyne Road
Dundee DD5 1NY
United Kingdom
Phone: +44 - 382 - 455053
Fax: +44 - 382 - 455046

Environmental Education: The Assessment of Student Outcomes

Lisette van Aert & Lisette van Zoelen
University of Utrecht, the Netherlands

Working on the development of instruments for the assessment of learner results of activities in the field of environmental education in primary education, we encountered several difficulties. The purpose of the paper is to tell something about these difficulties and to have a discussion about possible solutions. In this abstract we will only mention the difficulties. In the actual paper we will also go into possible solutions, we will offer a list containing points of special interest which can be used in developing similar instruments and we will show some results.

When there is spoken of learner results or effects, we do not only mean the gaining of knowledge or the growth of action skills but also changes in attitudes, values and behavior and the growth of decision-making skills.

In the paper we combine two different studies which are carried out at the University of Utrecht. In both studies instruments have to be developed. In the first study we are developing an instrument in order to determine the learner results of working with new curriculum materials in which, among other things, special attention is being paid to environmental education. The group we focus on are 8 - 9 year old pupils. In the second study the aim of the instrument is to assess the results of outdoor activities, which are being organized at a special centre for environmental education. The pupils in this study are 10 till 12 years old. The character of the activities in the two studies differ, however both activities try to achieve that pupils act in a way that contributes (more) to sustainable development. Sustainable development is a development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs.

The reason that in both studies special attention is being paid to the development of instruments which make assessment of learner-effects possible, is the emphasis on evaluation nowadays and the lack of instruments to do so. Not only subsidisers want to gain insight into the activities which have the effects, they claim to have. Of course also curriculum developers are interested, because such knowledge makes it possible to improve the different activities and materials.

During the projects we had to encounter different difficulties and problems. First of all talking about environmental education brings about the complex discussion of different goals. For example, the employees of the institution we worked with in the second study, wanted to bring forth changes in attitudes and behavior. Therefore they conduct all kinds of activities and interactions with pupils. However, asked for an description of their goals, it appeared to be very difficult for them to decide on the exact goals they pursue. It took a long time and a lot of discussions to get them clear about that.

Furthermore, it was not always clear what was meant by the different conceptions. An example is values. Pieters (1992) describes two different categories of definitions. The first category states that values are qualities attributed to objects being judged while in the second category there is a connection with acting. An example of the second category reads 'values are normative beliefs, in the sense of rules that have to be followed when a person acts'.

After the formulation of the goals we tried to operationalise the different aspects we wanted to measure. The first dilemma we encountered concerned the curriculum specifity. What kind of items do we want to develop: curriculum specific or unspecific items? Of course we were interested in knowing how much of the goals where achieved by the pupils, but we were also interested in the behavior of pupils in other situations. Does the lesson material or activity contribute to other behavior or attitudes in new situations?

Furthermore, it appeared that it is not always clear which behaviors or attitudes contribute to sustainable development. The eco-systems and therefore also the environmental problems are very complex. When formulating items we experienced that it is very difficult to make them univocal. The desirability of an attitude or a specific behavior, depends on the point of view and the situation of the respondent.

A third problem that occurred during the operationalization process, was the question which type of instrument was most suited: for example an oral or written questionnaire. When a written questionnaire is chosen, are open or structured answers more suited? Is it advisable to use scales, or is it better to use moral dilemma's and learner reports?

Finally the pupils in the two projects are very young (actually primary school, 8-9 and 11-12 years old). This has a lot of consequences. To mention a view:

- You cannot use all the words and concepts you want to use because children simply do not understand them;
- The amount of text has to be small;
- The items have to fit the moral and cognitive development of the pupils. Therefore it is needed that the items concern the daily life of children, and matters for which they can bear responsibility.

As stated before, in the actual paper we will also go into the chosen solutions and show some results.

L.C.M. van Aert & E.M. van Zoelen
University of Utrecht
ISOR
P.O. Box 80140
3508 TC Utrecht
The Netherlands
Phone: +31 - 30 - 534941
Fax: +31 - 30 - 532352

Students' own Productions as a Source for Developing Assessment

Marja van den Heuvel-Panhuizen & Leen Streefland
Freudenthal Institute, the Netherlands

Jim Middleton
University of Wisconsin, United States

Introduction

The paper addresses development research on assessment. The study as reported about is a part of a more extensive curriculum development project named *Mathematics in Context*. This NSF funded project is carried out by the National Centre for Research in Mathematical Sciences Education at the University of Wisconsin, Madison, in collaboration with the Freudenthal Institute of the University of Utrecht, The Netherlands. The aim of the joint project is to develop a new mathematics curriculum for the middle grades 5-8 (students aged 10 through 14 years). Because innovation of education cannot succeed without suitable ways of assessment, the *Mathematics in Context* project contains also development research on assessment. One of the studies that is carried out in this respect focuses on the improvement of the problems used for assessment. The search for good problems that is at issue in the present study is connected in one way or another to a grade 5 instructional unit on percents, called Per Sense.

Central problem and research design

The crucial question to be answered is: What problems evoke the intended information one needs in order to be able to assess the teaching-learning process in an adequate manner? Due to the amount of available literature many answers have been given so far. But what about the children themselves? Answering this question implies a change of perspective. Therefore in the present study student generated problems are investigated and used to improve assessment problems and to bring forward theoretical notions about assessment of mathematics education in general. The students in the study got an own production assignment in which they were asked to think of an easy and a difficult problem on percents. Moreover, the students were asked to explain why they found the problems easy and difficult respectively.

The own production assignment was tried out in two American grade 5 classes, including 44 students. The students' responses were analyzed from different points of view:

- what do students think are easy problems and what difficult ones;
- are the students aware of the reason why a problem is easy or difficult; and
- what are students' ideas about problems on percents, like, for instance, what do they think problems should look like?

The results revealed by the own production assignment will be discussed in the paper to be presented.

Results and some additional findings

- The analysis of the student generated problems showed a large variety of what the students considered to be easy problems. The same was true for what they considered as difficult ones. A problem which was labelled as easy by one student could be labelled difficult by another student. On the whole, the collection of problems cover the range of ability levels of students at grade 5 and further quite well. This means that the own productions do not only offer a cross-section of the understanding of a class at a particular moment, but they can also give a longitudinal intersection of the learning path the students will follow globally. In other words, they cover a complete 'curriculum on percents' for grade 5. As such they offer a nice view at the educational objectives from the learners' perspective, which provides not only important information for developing assessment, but can also be of great value for curriculum development.
- The students' responses revealed that in most of the cases the easiness of a problem has to do with the easiness of the percentages or numbers. The difficulty is mostly caused by large numbers, uneven numbers, or difficult percentages, and by the complexity of the structure of the problem (backwards reasoning, comparing situations, much data, lacking data). An important finding both for assessment development and for curriculum development was that in general the students were quite aware of the underlying feature that makes a problem easy or difficult.
- The student generated problems showed a great variety in kinds of problems. It illustrates that assessment problems do not need to be restricted to word problems and formal problems only.

The broad, holistic way in which the student generated problems were analyzed yielded more than answers to the research questions only. A further analysis turned out that the own productions showed the influence of the teaching process on two levels. The context, the models, and the queries for explaining the answers that feature the problems, reflected the content and the intention of the Per Sense unit very clearly. Besides this influence of the instructional unit, also the influence of the teacher could be indicated. A closer look at the two classes gave evidence for the conclusion that despite of the fact that both teachers used the same unit, their students made different kinds of problems.

Finally, the quality of the problems revealed that it would not be a bad idea to call in the concrete help of students for the development of assessment problems.

M. van den Heuvel-Panhuizen
University of Utrecht
Freudenthal Institute
Tiberdreef 4
3561 GG Utrecht
The Netherlands

Phone: +31 - 30 - 611611
Fax: +31 - 30 - 660430

Third International Mathematics and Science Study (TIMSS): Analysis of the Dutch Intended Curriculum for Mathematics and Science

Wilmad Kuiper & Klaas Bos
University of Twente, the Netherlands

TIMSS objectives of and conceptual model

TIMSS is a study undertaken under the auspices of the International Association for the Evaluation of Educational Achievement (IEA). The overall objective of TIMSS is to attempt to describe and explain (differences in) math and science achievement nationally and cross-nationally in the context of instructional practices, curricular offerings and educational arrangements (Robitaille, 1993). Nearly 50 educational systems, among which The Netherlands, are currently participating in TIMSS. Data collection is scheduled in Spring 1995 in the northern hemisphere, with the first international report of the results to be published in the third quarter of 1996. The Dutch contribution to TIMSS is executed by the Centre for Applied Educational Research (OCTO) of the University of Twente.

TIMSS has four major foci: a description of national educational systems, an in-depth analysis of the mathematics an science curricula, an investigation of instructional practices, and an assessment of students' mastery of the curriculum as well as their attitudes and opinions. Fundamental to the design of TIMSS has been the recognition given to the importance of curriculum as a variable in explaining differences among national school systems and in accounting for differences among student outcomes (Robitaille, 1993). For the purposes of the study, curriculum is conceived of as the concepts, processes, and attitudes in mathematics and science that are intended, implemented and attained.

The *intended* curriculum may be described in the form of the mathematics and science concepts, processes, and attitudes students are expected to study and learn. It is embodied in textbooks, in curriculum guides, in the content of examinations, and in policies, regulations, and the official statements generated to direct the educational system. The *implemented* curriculum is the mathematics and science content as it is interpreted by teachers and made available to students. The *attained* curriculum consists of the outcomes of schooling - the concepts, processes, and attitudes towards mathematics and science that students have acquired in the course of their schooling years.

TIMSS focuses on three age-grade levels of students and these are referred to as population 1, population 2, and population 3. In general terms, population 1 addresses the two adjacent grades containing the majority of the 9-years-olds (in The Netherlands grade 5 and 6 of primary education). Population 2 addresses the two adjacent grades that include the majority of the 13-year-olds (in The Netherlands the first two grades of secondary education). Population 3 includes all students in their last year of secondary education, regardless of the kind of program in which they are enrolled (in The Netherlands pre-university education, upper general secondary education, and senior vocational education). Sources for data collection include questionnaires to be completed by students, teachers, principals, and persons who are knowledgeable about the educational system involved. Students will respond to sets of achievement and performance items in mathematics and science.

Document analysis

The in-depth analysis of the intended curriculum is fundamental background for understanding what teachers do in the classroom (implemented curriculum) and provides an important context for understanding what students achieve (attained curriculum). Also it is important by itself. The curriculum analysis includes among other things a *document analysis*, aimed at providing data about what topics are intended to be studied and learned in the upper target grade, about what kind of students' performances are expected, and about what attitudes are promoted. The paper focuses on the document analysis for population 2 in The Netherlands.

The document analysis encompassed mainly an analysis of mathematics and science textbooks in most widespread use in the upper target grade. The emphasis was on textbooks as especially those curricular materials mediate the influence of the intended curriculum on classroom instruction. The document analysis was executed according to an detailed international standard-procedure (described in the paper; McKnight et al., 1992), and using curriculum frameworks for mathematics and science (described in the paper).

For population 2 ten textbooks were analyzed, selected after consulting research data on textbooks use (Kühlemeier, 1989, 1990; Kuiper & Alting, 1990), and after consulting mathematics and science education experts. Selection was based on three criteria: (1) cause of budget constraints not more than two textbooks per subject (mathematics, biology, physics, chemistry, and geography) could be selected; (2) the two textbooks per subject should represent 50% or more of the textbook market for the two target grades across the four student ability tracks (for chemistry the third grade, cause of the fact that this subject is not scheduled in the two target grades); (3) if possible, the implementation of basic education - a major curriculum reform which is being implemented from August 1993 onwards in lower secondary education (see Kuiper, 1993) - should be somewhat reflected in the selection. The latter meant the selection of innovative textbooks matching the core objectives for basic education.

The selected textbooks were analyzed by teachers, pairs of student teachers, and TIMSS researchers. A field trial and intensive training sessions preceded the analysis process. The analysis process went off in two phases, from Fall 1992 through Spring 1993.

Results and discussion

Due to delays in the data entry and analysis process (conducted at Michigan State University, US), the results of the document analysis are not yet available at the moment. As a consequence, in the paper we only reflect on the procedure we followed, on the instruments we used, the estimated quality of the data that will come available, and on validity and reliability issues.

Wilmad Kuiper
University of Twente
Faculty of Educational Sciences and Technology
P.O. Box 217
7500 AE Enschede
The Netherlands
Phone: +31 - 53 - 893757
Fax: +31 - 53 - 329136

Klaas Bos
University of Twente
Centre for Applied Educational Research
P.O. Box 217
7500 AE Enschede
The Netherlands
Phone: +31 - 53 - 893955
Fax: +31 - 31 - 315099

TIMSS Document Analysis of Textbooks in Norway: a Method for Analysing how Different Scientific Subjects are Presented in Science Textbooks

Inger Fjørstad
University of Oslo, Norway.

Abstract

According to Robitaille et. al. (1993) one of the hallmarks of the Third International Mathematics and Science Study (TIMSS), a study conducted by the International Association for the Evaluation of Educational Achievement (IEA), has been the recognition given to the importance of curriculum as a variable in explaining differences among national school systems and in accounting for differences among student outcomes. When describing the curriculum, textbooks are an important factor, because text materials usually are the main means for implementing the curriculum in the classroom (see McKnight 1992). Therefore the Document Analysis (DA) part of TIMSS, which is an analysis of official curriculum documents, will study many aspects of the textbooks, as well as curriculum guides.

I shall concentrate upon presenting results from analysis of the DA data with respect to how different science subjects are presented in Norwegian science textbooks for elementary and lower secondary school. I shall also shortly discuss some basic concepts in the DA procedure for analysing textbooks with the above mentioned analysis of the DA data in focus. A detailed description and evaluation of the DA procedure in general is provided in the paper presented by Kuiper and Bos. We have chosen textbooks that are used mainly for students age 9 (third grade, elementary school) and 13 (seventh grade, lower secondary school), in TIMSS called population 1 and 2. The criteria for the selection of textbooks will be presented and commented upon.

One important question when comparing curricula for several countries is how much attention a topic receives in each country. A uniform procedure for analyzing texts helps to answer this question. The DA procedure attempts to divide materials into similar pieces called "unit of analysis" in all countries. A discussion of the definition of this "unit of analysis" is provided.

Each unit is further divided into sub-units called blocks. (The division into units and blocks are described in detail in McKnight et. al, 1992). These sub-units are then characterized by, among other things, several variables for content, expected student performance (cognitive behaviour and skills) and perspective (view of the nature of the discipline exemplified in the material, or the context within which the material is presented). The categories for these aspects are given in the TIMSS Science Framework, described by Robitaille (1993). A description of the Science Framework is also provided in the paper presented by Kuiper and Bos. Since there is much information about each block, I will often use "block" as the

basic element of study in statistical analysis of DA data from textbooks. When using block as the basic element, there are some problems that need to be taken into account, and these will be discussed.

In Norway the textbooks chosen for the analysis were science textbooks that are used by more than 50% of the pupils in the chosen grades. We have analysed textbooks from all school subjects that contain science topics in those grades. The textbooks were sampled by purposive sampling, a nonprobalistic sampling method, which will restrict the conclusions that can be drawn from the Norwegian DA data. This will have some consequences for the use of the results from the Norwegian DA analysis, and will be commented upon in my paper.

Due to delays in the data entry process, we don't yet have clean data files, but superficially checking has shown few errors. It's therefore meaningful to present some preliminary results based on the current data files.

The content aspect of the Science Framework has two dimensions:
- scientific subjects: earth science, Biology, Chemistry and Physics;
- cross-subject themes such as "history of science and technology" and "environmental and resource issues related to science".

In my analysis I have chosen to focus on the different scientific subjects. The analysis has shown that Biology is the dominating subject in the chosen science textbooks for both population 1 and 2. The textbooks also gives some attention to Physics and Chemistry. However, regarding earth science there are some differences between the textbooks with respect to emphasis. Student performance required in using the textbooks is mostly understanding. The presentation of topics has little context, and seldom gives the students any view of the nature of the discipline (that is, perspectives as they are defined in the Science Framework are very scarce in the textbooks). Although the textbooks consequently have some general features in common, there are additional differences between the chosen textbooks with respect to emphasis on content, expected student performances and perspectives among other things. These results will be provided in greater detail. I'll give examples of how the DA data can show differences and similarities in textbook presentation of different subjects, and bring some results from such an analysis of a Norwegian textbook from the seventh grade. This analysis has among other things shown that with respect to expected student performance and perspectives, there are some interesting differences between the scientific subjects which will be presented.

I.E. Fjørstad
University of Oslo
Centre for Teacher Education and In-Service Training (SLS)
P.O. Box 1099
0316 Blindern, Oslo
Norway

Phone: +47 - 22854048
Fax: +47 - 22854409

Curriculum Indicators in International Comparative Research

Hans Pelgrum, Joke Voogt & Tjeerd Plomp
University of Twente, the Netherlands

In past decades, political and educational discussions have increasingly raised questions about the quality of education. For monitoring the quality of education, programs for national assessment of educational progress were implemented in many countries. Initially most of these programs heavily emphasized the measurement of educational achievement of national samples of students in basic school subjects. However, the increasing awareness of the usefulness of these monitoring systems resulted in a need for indicators which can help in tracing the deficits and clues for taking measures for improving educational outcomes. A potential powerful set of indicators dealing with the substance of education can be found in the curriculum.

Curriculum can be conceived at three levels. At the macro level of the education system (nation, region) there exists the intended curriculum, at the meso level (school or classroom) the implemented curriculum and at the micro level (students) the attained curriculum. For each level specific indicators seem to be relevant. The intended curriculum can be determined by examining course outlines, textbooks or examination syllabi. The implemented curriculum can be measured by course content, time allocations or instructional strategies. The attained curriculum establishes student outcomes by measuring cognitive skills and attitudes of students. In addition curriculum antecedents, such as the social background of students' family or school neighbourhood as well as resources possessed by schools can be correlated with curriculum contexts to predict curricular outcomes.

In this paper we reviewed 70 publications from research literature based on large scale national as well as international assessments, on curriculum indicators. In the review we particularly paid attention to the implemented curriculum, that is to identifying indicators about what is or ought to be taught, by and to which participants and in which way. Moreover, information was sought with regard to reliability and validity of the indicators and as how the indicator data might be used for diagnosing educational shortcomings.

In total we found 250 different indicators which dealt with the curriculum and for which actual empirical results from national samples were available. From a first overview it appeared that there exists a lack of consistent terminology in the field of curriculum indicators. For instance an indicator such as Opportunity-to-Learn, referring to the implemented curriculum, can be found as Topic Coverage or as Test-Curriculum-Overlap as well. We found five global categories of indicators under which the several curriculum indicators can be classified, namely content, time, participants and instructional characteristics. These categories will be discussed profoundly in the paper. The analysis of the validity and reliability of the indicators used, showed that in only 20 of the reviewed

publications attention has been paid to either reliability or validity or both. Most remarks about reliability referred to problems with data collection, while the remarks about validity referred to ,predictive validity, that is the relation between the indicator and student achievement. Only a few studies analyzed reliability and validity more in depth.

From this review it is concluded that the implications of curriculum indicators until now are quite meagre, and not very well applied as diagnostic tool in a monitoring system. In the paper steps for further development and research in this area will be proposed.

W.J. Pelgrum
University of Twente
OCTO
P.O. Box 217
7500 AE Enschede
The Netherlands
Phone: +31 - 53 - 893593

J.M. Voogt
University of Twente
Department of Educational Science and Technology
P.O. Box 217
7500 AE Enschede
The Netherlands
Phone: +31 - 53 - 893559
Fax: +31 - 53 - 329136

Tj. Plomp
University of Twente
Department of Educational Science and Technology
P.O. Box 217
7500 AE Enschede
The Netherlands
Phone: +31 - 53 - 893595
Fax: +31 - 53 - 329136

Thirty Years of Controversy: Curriculum Research and Development in England, 1964 - 1994

Bob Moon
The Open University, England

This plenary address will examine the interplay of social, political and educational forces that have characterised curriculum research and development in England over the last thirty years. The central concern of the paper will be the impact on research and development of successive ways of governmental intervention in curriculum affairs, beginning with the establishment of the Schools Council for Curriculum and Examinations in 1964 and culminating in the furore that surrounded the introduction of a national Curriculum in 1988 and the subsequent announcement of its wholesale revision in 1994.

A number of themes will be examined in this address, including:
- the successive stages that characterized a school centred, decentralised model of curriculum organisation to one of the most prescriptive examples of curriculum legislation in Europe;
- the role that curriculum researchers and developers played during this period, and the extent to which they influenced the various stages of governmental intervention;
- the strategies by which the curriculum research and development community established an alternative agenda to that determined by the formal National Curriculum.

The analysis will make cross reference to parallel developments in other European countries and suggest some key underlying issues which through analysis can inform the future direction of curriculum research and development in the 1990s.

The speaker will draw on research and publication on this theme, including:

* Changing schools, changing curriculum (1983). London: Harper Row (with Galton, M.) translated into Spanish, Cambiar la escuela, cambiar el curriculum, Martinez Roca (1986).

* The 'New Maths' Curriculum Controversy: An International Story (1986) Lewes: Falmer Press.

* The National Curriculum: Straightjacket or safety net (1989). London: LEA Publications (with Mortimore, P.).

* Policies for the curriculum (1989). London: Hodder & Stoughton (with Murphy, P. & Raynor, J.).

* New curriculum, national curriculum (1990). London: Hodder & Stoughton.

* Managing the national curriculum: Some critical perspectives (1990). (with Brighouse, T.). London: Longman.

* A guide to the national curriculum (1991). Oxford: Oxford University Press (second edition 1993).

R.E. Moon
The Open University
Inst. of Educational Technology
Milton Keynes MK7 6AA
United Kingdom
Phone: +44 - 908 - 652391
Fax: +44 - 908 - 652218

Images of the Inquiry Curriculum: Innovative Profiles of the German Primary School

Uwe Hameyer
University of Kiel, Germany

A brief historical look at the post-war decades of primary school development in Germany shows varying attention to curriculum research. The vital period from 1968 through 1983 turned out to be a peak of curriculum theory and research. Within this period, powerful theories such as the situational approach of *Robinson* (1967) or the process theory of Karl *Frey* (1978.) attracted sustained attention. Yet, links between the tradition of didactics and modern curriculum theory remained marginal.

After 1983 [when the German handbook of curriculum research was published], growing disengagement of researchers in the curriculum domain caused discontinuation in curriculum theorizing. Only in the beginning of the 1990s did it happen that a new attempt started in several states to initiate syllabus revision, mostly stimulated by state authorities rather than by universities or research institutions. It looks as if policy-makers with their attempts to renew the core curriculum and local cultures of schools are the main initiators of revitalizing curriculum renewal and theory discussion.

The large-scale renewal of the primary school curriculum is still active. The contribution will elaborate the driving forces behind this movement which focuses - to some extent - on the enrichment of inquiry-based learning opportunities. The core issues at stake and the images behind them will be elucidated.

In an exemplifying section, examples from one of the states in Germany, Schleswig-Holstein, will be given to specify basic domains of curriculum decision making and images about the inquiry curriculum which, in turn, mirrors fundamental tasks of curriculum research and theory. However, many of such approaches will have to be clarified and investigated. Some of the basic domains are as follows: structures of the core curriculum, key qualifications as a rationale for the syllabus, impact of societal change on the school, deregulation and autonomy, patterns of designing the syllabus, professionalization of teachers.

The contribution finalizes with concrete images and examples of curriculum renewal. These components are exposed to the public for the first time such as the 14 basic educational ideas (*Leitthemen*) which serve as the outset of the core curriculum on the primary level where six- to ten-year-old students are educated. These basic educational ideas formulate topics and needs which build a focus for interdisciplinary work in the school and project learning across subjects.

U. Hameyer
University of Kiel
Inst. of Education
Olshausenstraße 75
D-24118 Kiel
Germany

Phone: +49 - 431 - 8801567
Fax: +49 - 431 - 8801567

Evaluation Trends in Dutch Curriculum Research and Development

Jan van den Akker
University of Twente, the Netherlands

Curriculum evaluation is a many-sided concept. It links two comprehensive and well-established domains in the field of education, illustrated by the fact that each has its own separate volume of The International Encyclopedia of Education (Lewy, 1990; Walberg & Haertel, 1990). The many sides of curriculum evaluation are also reflected by the multitude of curriculum evaluation models presented in the literature (see Alkin, 1994, for a recent overview).

This presentation on curriculum evaluation in The Netherlands will focus on evaluation approaches and results in both curriculum research and professional curriculum development practices. Since both constitutive domains, "curriculum"and "evaluation", are somewhat notorious for their elusiveness and the gap between rhetoric and reality, special attention will be paid to the user perspective of curriculum evaluation.

We will concentrate our analysis on trends and findings in the last decade. We will refrain from dealing extensively with general, less curriculum-specific forms of educational evaluation, like large-scale (inter)national assessment studies of student achievements. However, we will broaden the curriculum scope by including evaluation of less traditional objects and contexts, e.g. evaluation of courseware, and evaluation of training in business and industry.

The review starts with a brief description of the organizational scenery of curriculum evaluation in The Netherlands, distinguishing various aims and contexts of evaluation. Next, we will provide an overview of curriculum evaluation research in the last decade, discussing the methods and outcomes of these studies. In this overview we will distinguish between evaluation research on products from generic curriculum development projects and evaluative findings from other curriculum research. Then, we will pay attention to evaluation practices in different professional development contexts. The article will be closed by some discussion on recent trends and future challenges for curriculum evaluation.

J.J.H. van den Akker
University of Twente
Faculty of Educational Science and Technology
P.O. Box 217
7500 AE Enschede
The Netherlands

Phone: 053- 893551
Fax: 053 - 329136

The Quality of Textbooks, a Preliminary to Successful Curriculum Implementation

Marita Tholey
National Information Centre for Learning materials, the Netherlands

Introduction

In this paper the following topics will be addressed successively :

- Curriculum reform and the quality of textbooks are closely interrelated.
- Textbook analysis should be of some support to those who use and develop textbooks, which means it should be close to educational practice.
- Systematic textbook analysis is a strategy for the implementation of curriculum reform.
- Criteria for textbook analysis can be derived from curriculum documents containing educational objectives.

The pilot project "Development of instruments for the analysis of textbooks for 12 to 15 year olds" carried out by the Netherlands Information Centre for Educational Resources, NICL, a department of the Netherlands Institute for Curriculum Development, SLO, will serve as a case to illustrate the statements mentioned above. The project was started as a response to the introduction of the new core curriculum for lower secondary education in the Netherlands.

The central research question was: To what degree have textbooks available on the Dutch market for 12 to 15 year olds integrated the innovational aspects of the core curriculum, content as well as methodology?

The criteria for the analysis were derived from the core objectives formulated in the curriculum documents, as well as the general objectives for the core curriculum.

In the project instruments were developed for the subjects English and Mathematics. In this paper some results will be presented for the subject English.

The results show how textbook analysis by means of these instruments, can give an incentive to textbook selection, textbook use and textbook development.

Textbooks are the curriculum in practice

Textbooks have an important function in structuring the educational process. For teachers they offer a choice of subject matter as well as a pedagogical concept to convey the subject matter. For students they are a source of information and a means to develop the necessary skills. Research in the Netherlands shows that teachers of 12 to 16 year olds usually follow the textbook closely in their lessons, the topics as well as the assignments. Pupils spend 80% of their time at school using textbooks. Textbook dependency -regretted by many, applauded by others- is a reality to be found in many countries, from which we can conclude that textbooks are most important carriers of curriculum reform.

One could even say that the content of the body of textbooks produced in a country reflects a national consensus on the knowledge, skills and values that are considered to be important for students to acquire.

The quality of education therefore is closely linked to the quality of textbooks, and curriculum reform processes will only be successful, if they are eventually reflected in textbook content.

Criteria for textbook analysis and assessment

Many countries have textbook approval procedures to ensure textbook quality, others have a system where teachers are free to choose their own textbooks using a list of selection criteria. In whatever form it takes place textbook assessment is closely related to the criteria being used and the priority assigned to the various criteria. When setting up criteria for textbook assessment various scientific disciplines can serve as a source, depending on what you want to investigate. To show the impact of curriculum reform processes on educational materials, and thus on educational practice, the criteria for assessment of the quality of textbooks should be derived directly from the objectives formulated in the curriculum documents.

Educational objectives in the Dutch core curriculum

The emphasis in the core curriculum for lower secondary education (12 to 15 year olds) in the Netherlands lies on application of knowledge, development of skills and coherence, rather than encyclopedic knowledge, a development which has taken place in many countries. The general skills are formulated as follows:

Pupils can:

- carry out a simple research assignment alone or in cooperation with others;
- formulate their own point of view on the basis of arguments, being able to differentiate between facts and opinions, cause and effect;
- cooperate on assignments: make a plan, distribute tasks, explain, present results together (interactive learning);
- establish a link between what they have learned and concrete job situations or higher education;
- judge their own work on the basis of criteria developed beforehand.

So, textbooks should not only transmit factual knowledge but should also give the opportunity to develop skills and critical thinking.

In our pilot project, therefore, the emphasis in the analysis lay on the development of skills rather than on the subject content, keeping in mind, though, that the way in which the subject content is presented can be of great importance for the development of skills.

Method of analysis

Like most of our analysis projects the pilot project "Development of instruments for the analysis of textbooks for 12 to 15 year olds" started off with the analysis of curriculum documents in which the educational objectives to be achieved can be found. Next to the general skills mentioned above the translation into skills for the different subjects formed the basis for the analysis.

The characteristics of the instruments to be developed were the following:

- developed (primarily) to analyze (3 year) course materials;
- developed to assess the potential of the material, not the learning effect;
- based on discriminating categories;
- based on categories derived from curriculum reform documents

The method used combines elements of the quantitative and the qualitative approach.

For the subject English great differences could be found with respect to the criteria in the different materials analyzed.

M.R. Tholey
Inst. for Curriculum Development (SLO)
Information Centre for Educ. Resources
P.O. Box 2041
7500 CA Enschede
The Netherlands
Phone: +31 - 53 - 840560
Fax: +31 - 53 - 307692

The Use of Arithmetic-Math Textbooks in Primary Schools

Willem de Vos
University of Utrecht, the Netherlands

Research questions
At the faculty of Education of Utrecht University research is currently being carried out aimed at analysing factors that influence the use of textbooks.

The present research is linked to other research in this area concerned with textbook-use in class in general and particularly the circumstances and factors that determine their actual use. In the Netherlands previous research has been carried out since the seventies. Recently van den Akker (1993) categorized a large number of relevant factors into four groups:
- factors to do with the national school policy;
- factors to do with the organisational characteristics of schools;
- factors related to the external and internal counselling of teachers;
- factors related to the characteristics of the textbooks.

In this context the last set of factors will be highlighted. The aim of this paper is to investigate the relation between the characteristics of (two) textbooks used for maths, and the way they are being used. The following two questions were formulated:
- How are the procedural specifications described in the textbooks 'Rekenen en Wiskunde' ('Arithmetic and Mathematics') and 'De Wereld in Getallen' ('The World in Numbers') for teachers in group seven of primary schools?
- How do teachers of group seven in primary schools use the textbooks 'Rekenen en Wiskunde' (R&W) and 'De Wereld in Getallen' (WiG)?

Procedural specifications are concrete and specific textbook-instructions for the teacher in order to prepare, manage and present the arithmetic-math-lessons (van den Akker, 1988).

Design
The first question will be answered by analysis of documents. For the answer to the second question we use classroom observations and interviews with teachers.

Analysis of documents
To begin with, an analysis was made of the procedural specifications of both books. We focused for this on the number of concrete and specific instructions and relate these to twelve didactic objectives of which six can be seen as general and six as subject-oriented. Differences concerning these objectives between the two textbooks are scored on a five-point-scale (ranging from 'not specified' to 'highly specified'). Two independent judges rated these differences. The mean Cohen's Kappa, between the rating of the judges regarding the analysis of the textbook-introductions was .50. The mean Cohen's Kappa for interjudge-ratings on the textbook-lessons was .73.

Observations

Using the event-sample-method we answered the second research question by observing ten teachers. The observation instrument has twelve categories which correspond to the twelve didactic objectives of the document analysis. The observations and textbook lessons were compared and subsequently evaluated to find out to what extent the teachers deviated from the suggestions and specifications in the textbook. The Cohen's Kappas of sixty lesson-observations range from .65 to .85.

Interviews

With each of the ten teachers we held a semi-structured interview. In these interviews we focused on preparing lessons, use of additional materials, the lesson content, and the teacher's beliefs and intentions.

Reliability and validity

Each school represents a separate case that we analysed at various levels, i.e. the textbooks 'as such', the use of the textbooks in the class-room and the textbooks as they were experienced by the teachers. The research focuses on four aspects of quality, as mentioned by Yin (1989) and Miles and Huberman (1984). In this paper we will present the results of the cross-site analysis.

Tentative results

(Question 1) The R&W textbook manual contains more detailed specifications than the WiG manual (a difference of 0.8). Similarly, the lessons in R&W show greater abundance in terms of concrete instructions and suggestions for teachers (a difference of 0.4).

(Question 2) Differences in procedural specifications lead to a difference in the way of giving the lessons. Teachers using R&W show more interaction with pupils and spend more time on subject-oriented didactic objectives than teachers using WiG. Teacher beliefs and composition of the various groups of pupils are two other factors that influence the use of arithmetic-math-textbooks.

Willem de Vos
University of Utrecht
Faculty of Education,
Heidelberglaan 2
3584 CS Utrecht
The Netherlands
Phone: +31 - 30 - 533707
Fax: +31 - 30 - 532352

Analysis and Judgement of Teaching Courses within the Framework of an Educational Innovation

Willem van Dijk
University of Utrecht, the Netherlands

Peter Edelenbos
University of Groningen, the Netherlands

Since August 1993 a large scale innovation of the first grades of Dutch secondary schools is taking place. This so-called 'basisvorming' [basic education] is obligatory to every pupil in every school. In general secondary education and lower vocational education it takes respectively two or three years to meet the demands of 'basic education'. These demands have been made explicit in the core-objectives for each of the fifteen subjects that have to be taught. These core-objectives can be described in terms of three major characteristics: applicability of knowledge (**T**oepassing), skills supporting the acquisition of knowledge (**V**aardigheden) and integration of knowledge and skills from different domains (**S**amenhang).

The TVS-characteristics are related to the concept of 'authentic learning' or Kolb's phase theory of learning (experiencing, thinking, knowing and doing). They imply education that is quite different from traditional teaching practice. So, the introduction of basic education places a heavy burden upon the teaching staff of secondary schools: they have to attend in-service courses, they should alter their actual teaching behaviour and they have to accustom themselves to new teaching courses (textbooks).

It is common practice for Dutch teachers to use teaching courses put on the market by educational publishers, who hasted into publishing 'new' teaching materials which had to meet the TVS-characteristics. Some materials are in fact only slightly altered versions of already existing courses and some are brand new. For many subjects secondary schools have the possibility to choose from six to ten courses, which vary in the way they adopted the TVS-characteristics.

To facilitate the process of choosing an appropriate teaching course CLU and RION have set up a study to analyse and judge teaching courses to be implemented in 'basic education'. The main research questions are:

- How can the TVS-characteristics be translated into an instrument to analyse teaching courses for basic education?
- How do the results of the analyses relate to the experts' opinions?
- What are examples of teaching courses, which are in tune with the TVS-characteristics, considering their contents, instruction strategies and assignments?

An instrument was designed to investigate a total of 20 teaching courses. For each of the subjects English, French, Dutch, geography and history four courses were selected. The instrument consists of seven parts:

- outline of the teaching course;
- contents related to core-objectives for the subjects;
- structure of the contents;
- instruction strategies;
- types of assignments;
- differentiation and
- testing and evaluation.

In each part specific guidelines are provided to perform analytical tasks. These seven parts were derived from the TVS-characteristics and the needs of teachers for which the analyses had to be performed.

Although the structure and contents of the instrument proved to be adequate, the instrument needed finetuning with respect to the human arts on the one hand and the languages on the other hand. Moreover, the highly qualified investigators which were appointed to carry out the analyses, needed intensive training before they could use the instrument satisfactory. The agreement among the investigators was satisfactory before the actual analyses were carried out and still was when the analyses were completed.

Furthermore, for every subject a panel of six experts judged the teaching courses with respect to the demands of basic education. For every subject the agreement among experts was very satisfactory.

The outcomes of the analyses and the experts' judgements showed that teaching courses vary in the way they meet the demands set by the core objectives and the TVS-characteristics. Hence, the results of this research are relevant in at least two respects. In the first place, the research showed that specific educational innovation characteristics can be translated into an instrument to determine the quality of teaching courses. Some teaching courses which were only slightly altered for their use in 'basic education', hardly contained subject matter related to the core objectives set for the subjects. On the other hand the analyses also showed that some 'new' teaching courses for 'basic education' don't contain sufficient subject matter to meet the actual demands that are specified in the core objectives. In the second place, the research shows that teachers have to determine pre-set criteria for choosing a teaching course. When these criteria are applied to the outcomes of the research (analyses and judgements), it is certainly possible for teachers to make valid choices.

W. van Dijk
University of Utrecht
Vakgroep Onderwijskunde
Heidelberglaan 2
3584 CS Utrecht
The Netherlands
Phone: +31 - 30 - 543797
Fax: +31 - 30 - 532352

P. Edelenbos
University of Groningen
Institute for Educational Research
Westerhaven 15
9718 AW Groningen
The Netherlands
Phone: +31 - 50 - 636635
Fax: +31 - 50 - 636670

Curriculum Development in Israel: Societal and Cultural Contexts

Miriam Ben-Peretz
University of Haifa, Israel

Israel is country of immigration and is characterized by its heterogeneous population composed of many ethnic and religious groups. Since the establishment of the State of Israel in 1948 the educational system has undergone great changes which had an enormous effect on the process of curriculum development. Two main events shaped the curriculum of the Israeli school:

- The transformation of the school structure and the formation of a socially integrated Junior High School, the aim of which was to raise the level of learning and to promote social contacts between students from diverse backgrounds.
- The change from a melting-pot ideology to a multi-cultural approach.

The paper will deal with the following issues:

- A brief background description of the Israeli educational system;
- Presentation of the different institutions and bodies engaged in curriculum development;
- A critical analysis concerning the following themes:
    - the nature of the decision making processes controlling curriculum development;
    - the specific features of content choices for Israeli curricula;
    - the role of teachers and community in the construction and implementation of curriculum materials;
    - insights into the hidden curriculum of Israeli programs;
    - some thoughts about the future trends of curriculum development in Israel.

Special attention will be given to the curriculum and its meaning in the various ethnic groups - Jewish, Arab and immigrants from various countries.

Miriam Ben-Peretz
University of Haifa
School of Education
Mount Carmel
Haifa 31905
Israel
Phone: +972 - 4 - 240911
Fax: +972 - 4 - 240111

Curriculum Development Strategies in Romania

Alexandru Crisan
Institute for Educational Sciences, Romania

Context

The idea of a deep-going reform of the Romanian educational system represents a great concern for all those involved in this field, either working in various decision-making institutions, or being researchers, teachers or people belonging to other professional and social categories. In this framework, there seems to be a consensus among specialists on the idea that any educational reform is - if not exclusively, at least mainly - a curriculum reform.

Starting from a sketchy image of some present-day aspects of the curriculum development (CD) in Romania, this paper intends to provide a series of elements concerning conceptual tendencies and priorities for a future strategy of CD - as part of a larger pedagogical reform in our country.

The problems we are referring to are grouped around three basic components - not the only ones, in fact - of a curriculum reform: the conceptual component; the strategical-tactical component, and, finally the institutional and managerial one, each of them having a number of (sub)components.

Conceptual level

At the conceptual level, as part of an overall curriculum policy, a whole range of problems have been cleared up:

- Theoretically, an option has been made for the educational model (the curricular one included) of post-industrialized (computerized) society. It is a transdisciplinary model supposing multiple adaptability, general and specific creativity; hence, the need to put a special stress in the future curriculum not on information, but (if we can call it so) on "teaching directly mental and practical skills/capacities", or "general disposibilities".
- The educational ideal, as an adjusting element of the new curriculum, is no longer the anachronic "formation of the working force"; this time it aims at "developing human individuality freely, entirely and harmoniously, building an autonomous and creative personality" (The Bill of the Education Law).

  Alongside with the new educational ideal, the principles which will directly adjust the curriculum development process in the future are the following:
  - equalizing the chances of entering and attending schools;
  - ensuring the open character of the system (vertically and horizontally), as well as smooth passings from one school stage to another;
  - improving the relationships between the so-called "general culture" (represented by a "core curriculum") and the specialized one;

- pupils' progressive guidance; option for a humanistic-democratic pedagogy (in management and interpersonal relations), with an alternative/pluralistic character.

Strategical-tactical component

Speaking about strategy design, we should take into account the interpenetration of two categories of realities: (1) the 'chart' of the strategy components and (2) their specific dynamics ('activation'), in terms of concrete schedule including the progressive process of planning, implementing, evaluating and reviewing the new curriculum. The main focus of this sequence will be on the planning strategies.

- The 'chart' of the strategy components:

  The first strategy refers to 8 basic components:
  - finalities (aims) of the educational system;
  - general objectives of the subjects (or "interdisciplinary fields");
  - attainment targets;
  - "curriculum" (in its restricted meaning, i.e. syllabi or "programme");
  - various types of materials (experimental teaching - learning; support and educational ones etc.);
  - examination/assessment;
  - pre-service training;
  - in-service training.

  Each of them has a number of subcomponents. I shall refer only to the most important ones, taking their functional interdependence as discussion premise.
- Specific ('activation'):

  The second strategy includes a (preliminary) experimental stage, an operational and a generalization one.
  - During the first stage, the attention will be focussed on the elaboration, experimentation and progressive sedimentation of a new curriculum (the teaching staff will be involved from the first moments of this approach). Roughly speaking, this stage will include the following moments:
    - redefining - in a first provisional working draft - the general finalities of primary and secondary education, according to the new conception governing the reform on the whole;
    - redefining in the same manner the general objectives of certain subject matters, "interdisciplinary matters", groups of subject matters etc.;
    - elaborating an outline based on the previous stage (a "discussion basis") regarding the new attainment targets;
    - elaborating a first guiding "syllabus" draft (not under the form of certain topics, titles etc., as before, but as some criteria for contents selection/organization or possible recommendations/examples for setting up certain topics, titles, modules etc., given as illustrations);
    - using the above-mentioned components as bases in making experimental teaching/learning materials worked out under the form of modules/booklets/works of reduced proportions;
    - simultaneous elaboration of certain experimental procedures to be used for assuring the examination and, at the same time, the assessment of performances;

  - experimenting these both types of materials in the classroom as quickly as possible; this process will give a feed-back absolutely necessary in reconsidering/restructuring the hierarchically superior components, and their relative outline; thus, it could be possible to assure a corpus of corrective elements, fundamental for setting up a new curriculum and significant for the following stages (lists of objectives, of attainment targets, criteria for content selection and organization, "syllabi" for examination etc.);
  - as an interface of these steps and parallel to them the development of a pre-service and in-service training system is required; this should be focussed on: (a) a proper curriculum aiming at developing certain pedagogical skills for building up/using the already mentioned components; (b) support materials for teachers;
  - at the end of the planning strategy a competition for school textbooks, support materials, innovating didactical technologies etc. can be announced; all these elements will be grounded on certain guiding lines relatively checked and consolidated this time, as well as on the new pedagogical skills acquired during the school practice with the experimental teaching/learning materials.
- This process can last for about 2-3 years; after this period the system would pass to the operational stage by:
  - publishing alternative non-experimental materials (booklets, textbooks, workbooks, multimedia aids etc.), whose single evaluation criterion (applied by an Independent Board) would be their fitness to the attainment targets approved by opinion consensus;
  - these textbooks would have to "penetrate" into the "pedagogical market" only because of their quality, and not by being imposed from the "Centre".
- The generalization stage will be achieved when the "Centre" activity focuses only on assuring curriculum framework, namely a certain coherence of national education, very widely understood. Such a coherence will perhaps be assured by two possibilities: (I) a unitary system of finalities and attainment targets; (II) a unitary syllabus (including the range of competences, "know-how", skills, knowledge etc.), the examination and assessment activities are grounded on.

Institutional and managerial component

As the institutional and managerial component is concerned, the paper will present firstly the new institutional framework created in order to plan a new national curriculum and secondly short-term and long-term curricular priorities for the Romanian education.

Future priorities

The main difficulties in defining certain priorities for the future are essentially of the following types:

- legislative (Education Law still being at the level of the Parliamentary Commission for Education, Science, Youth, Sport);
- financial (because, we should not forget, this reform is, first of all, a problem of investment, which is a top priority, of course);
- decisional (there has not been a clear decision yet, concerning the chosen strategic model, its directions and implementation steps).

However, I shall try to enumerate them, giving the following classification:

- Strategic Component:
  - elaborating a clear decisional option for one of the concrete tactics in curriculum development;
  - specifying the general schedule and the one referring to various subject-matters;
- Institutional Component:
  - specifying the involved institutions and the relation network among them;
  - stating precisely all the existing tasks;
  - elaborating the model for the teaching staff's involvement in curriculum development.
- "Content" Component:
  - introducing new fields of study demanded by society's changes (economics, business, marketing, social sciences etc.);
  - connecting economically pragmatical concepts to general humanistic ones;
  - assuring a core curriculum concerning communication, information processing, independent thinking, problem solving, human understanding etc.;
  - developing a capacities/skills-centered curriculum;
  - ensuring the transcultural/global dimension of the curriculum.
- Curricular Products:
  - elaborating the so-called recommended curricula for fundamental subject-matters (Romanian, Mathematics, History etc.) and those neglected before;
  - creating experimental teaching/learning materials.

A. Crisan
Institute for Educational Sciences
37, Stirbei Voda
70732 Bucharest
Romania
Phone: +40 - 0 - 16136491
Fax: +40 - 0 - 13121447

Trends in Curriculum Policy in the Czech Republic

Eliska Walterová
Institute of Educational and Psychological Research, Czech Republic

Introduction

Curriculum policy in the Czech Republic has undergone a substantial transition as the whole system of education since 1989. Central problems discussed in the paper are next: What changes have undergone the curriculum policy? Why relevant problems have not been solved? What are perspective trends?

The analysis is based on multidimensional approach consisting of:
- curriculum policy documentation analysis;
- empirical research on the Czech basic and secondary schools curricular reality;
- comparative analysis;
- personal experience from curricular expert group activity.

Changes in curriculum policy (1989-1994)

The term curriculum policy was unknown in the Czech Republic until 1989. An ideologically framed and uniform curriculum was centrally projected and taken as a norm for every school as a prescription for compulsory fulfilment. The absence of curriculum development at the school level produced negative consequences and discrepancies between formal and hidden curriculum. We can identify three stages in the mentioned period:
- First steps (1989-1990): Initial political and legislative measures concentrated on
  - deideologization;
  - teaching foreign languages;
  - cancellation of the state monopoly on textbooks;
  - development of own curriculum in private schools;
  - allowing schools to cover a part of curriculum autonomously (20-30%);
  - supporting freedom of teachers in classes.
- Bottom - up curriculum reform (1991-1992): Consequently conditions for initiative schools and teachers groups were created. School climate changed. Numerous alternative curricular programs, innovations and textbooks broke into schools. Demands on substantial, conceptual changes in curriculum were declared. Various groups made proposals on curriculum reform, e.g., educational experts, teacher initiatives, interdisciplinary groups as well as ministry of education developed several complex proposals. The proposals were mostly visionary framed, not offering common solutions and a general strategy of the reform.
- Demands on the standardization and on a participative model of curriculum policy (1993-1994): Demands on the new conceptual framework for curriculum increased consequently to the growing diversification of schools. A disintegration of common curricular core, an absence of aims adequate to the new social needs and a very slight pervadition of schools challenges political activities:

  - the Ministry of Education constructed two whole school curriculum projects offering to schools (16% accepted);
  - proposals for new basic and secondary education law have been discussed in the Czech parliament;
  - a group of experts has developed a curriculum policy model.

Present problems

The situation in the Czech curriculum policy is very similar to the most European countries having a liberal model in the beginning of the 1960s. However the starting point was opposite. Our present model reflects transition from normative centralistic to the pluralistic liberalized one. The main problems have been next:

- missing strategy of the curriculum reform;
- isolated and partial, ad-hoc and unsystematically involved changes;
- underdeveloped system of participative curriculum policy borning nonconsensual results and wrong communication among groups;
- an unclear competence (or even an absence) of monitoring, consultative, developmental and evaluative bodies.

Perspective trends

The main considered problem seems to find balance between a curriculum diversity and a standardization. Finding solution trends to a flexible and adaptive model based on two main levels:

- National level:
  - national curriculum framework respecting perspective trends of the social development (aims, content areas, time proportions);
  - guidelines and models for implementation on the school level;
  - system of standards as a starting point for evaluation.
- School level: accredited school curriculum respecting:
  - national framework;
  - local, group and individual needs.

The model needs gradual development. Preconditions are:

- a new legislative framework;
- building a system of participating bodies;
- a mechanism of communication and control.

Consequently a curriculum management has to be involved into teachers education and in-service training.

E. Walterová
Charles University
Institute of Educational and Psychological Research
Rettigove 4
11639 Prague
Czech Republic
Phone: +42 - 2 - 24910514
Fax: +42 - 2 - 290225

State Educational Standard and Development of Russian System of Education

V.S. Lednev & E.K. Straut
Russian Academy of Education, Russia

Now the main tendency of Russian school system development is transition from uniformity to diversity. This process we call "differenziazia" of education. Various kinds of it we may see at each step of school: primary (1 - 3th or 1 - 4th forms) and secondary - both middle (5 - 9th forms) and especially senior (10 - 11th).

The "Law about education" of the Russian Federation allowed school administrations and teachers to work out and to embed in practice their own curricula, textbooks and other school-papers. It will be a remarkable situation to implement properly the real goals of public education. But unfortunately some new school materials have no good quality. Moreover, certain subjects (especially physics) are turned out from study plan of some schools.

In order to prevent such and other illegitimate cases but simultaneously to maintain independence of regional and schools administrations in educational policy, the state educational standard is developed. The main interaction at current stage is guiding our school between two monsters: Scylla (i.e. full disorder) and Charybdis (i.e. full control from above).

According to the "Law about Education" the state educational standard covers:

- description of the content of education for each educational area, which the state is to provide students with;
- requirements for the students' minimum necessary preparation within each educational area undermentioned;
- maximum total study time allowed for school children per each year of studying.

There are three components of standard:

- federal;
- national-regional;
- local.

The first step of embedding standard is the basic study plan (see table).

According to this document the portion of the national-regional component is almost constant (28 - 29% of total time), while the federal component decrease from 55% for middle school (5 - 9th forms) to 24% for high school (10 - 11th forms). Consequently local component increases from 17 to 47%.

The first version of the content of federal component has been worked out by our institute.

EDUCATION AREAS	Forms / Hours per Week						
	Y	Y1	YII	YIII	IX	X	XI
Russian (State) Language	3	3	3	3	3	-	-
Language and literature	8	8	6	5	5	4	4
Fine Arts	2	2	2	2	-	-	-
Social Studies (History, etc)	2	2	2	3	4	4	4
Science (Physics, etc)	2	3	6	8	8	4	4
Mathematics	5	5	5	4	5	3	3
Physical Culture	2	2	2	2	2	3	3
Technology	2	2	2	3	3	2	2
Total	26	27	28	30	30	20	20
Obligatory Study	3	3	4	2	2	12	12
Individual, group studies, etc	3	3	3	3	3	6	6
Total time	32	33	35	35	36	38	38

Table: Basic study plan of Russian secondary schools.

E.G. Straut
Institute of Secondary School
Russian Academy of Education
Moscow 119903
Russia

Curriculum Development in Differing Contexts: Common Issues

Chair: Maurice Eash
University of Massachusetts, United States

Introduction
Curriculum development as both a process and product takes different faces in the varied contexts in which it occurs. As a process it has not been systematically studied as much as its products have been acknowledged and shared. The purpose of this symposium is to use case studies from four different contexts to explore and define a common set of issues that are generic to curriculum development activities despite the differing context variables. These case studies include the multi-levels of education, elementary school to graduate research university; widely varying subject disciplines; different countries with varying degrees of centralized administration of education; and differing foci for curriculum development activities (students, teachers, administrators, instructional materials, structural organizational changes). The presenters in the symposium are experienced curriculum developers who have served as faculty members, administrators, and consultants in universities, colleges, and elementary and senior high schools in the United States, Europe, Africa, and Asia. They bring to their perspectives on curriculum development over 100 years of experience and a lengthy record of scholarly study that has been reported in hundreds of publications. In this symposium they will each present a fifteen minute statement on curriculum development in a particular context, describing foci and activities, and briefly delineating the theoretical frameworks where relevant to the exposition. After the presentations, the symposium participants, acting as a panel, will pose questions or comment on issues raised in the presentations. This will be followed by minutes of questions and comments from the audience.

Curriculum Development Through Cooperative Learning and Peer Mediation

David Johnson
University of Minnesota, United States

The major pedagogical curriculum development in the last two decades has been the concern among educators for improved knowledge and skill in social interaction. The ability to effect social interaction in both individual and group contexts that negates settlement of differences through power conflict and leads to productive resolution of differences is crucial to both individual and group welfare in an increasingly interdependent world. Theoretical frameworks of conflict resolution and personality development have provided direction to research on curriculum development at the classroom level which can effectively impart learning that improves academic achievement and promotes healthy personality growth in the individual and in the society of which he/she is a citizen. These curriculum development efforts involve several competing frameworks that raise issues on the types of activities that are used to develop a curriculum in a classroom, e.g., what is the balance between cooperative and competitive activities; what is the role of didactic instruction in a cooperative based curriculum; at what level in the school system should curriculum development activities be conducted to implement cooperative learning and peer mediation; is it necessary to teach both of these conceptual frameworks simultaneously. These are some of the issues in curriculum development that are currently being studied in the ongoing work in cooperative learning and peer mediation in forty-six school systems in the United States and six foreign countries through the Centre for Cooperative Learning at the University of Minnesota. These research efforts over the last twenty-five years have produced a record of work on curriculum development in social interaction which is guiding curriculum practice and has defined in a new and telling way the issues that are central to effective curriculum development at the classroom level, whether it is in the elementary school or in an institution of higher education.

D.W. Johnson
University of Minnesota
Cooperative Learning Centre
Minneapolis, MN 55455
USA

Curriculum Development in Graduate Research Universities under Contrasting Systems of Governance

Werner Baur
Johann Wolfgang Goethe University, Germany

Curriculum development in the research university is influenced by endogenous and exogenous forces. As an endogenous force the faculty government, its structural organization and political orientation, exercises control over acceptance or excising of courses and programs, if curriculum is relegated as a major responsibility to the authority of the faculty. Other endogenous influences are students and their demands, the resources available and their internal allocation, and the relationship of faculty committee decision making to administrative control. Exogenous forces are significant factors in directing curriculum development chiefly through how the resources are directed or designated. Where undesignated resources are budgeted to a university, faculty governance can be a major influence; where designated resources are budgeted for specific courses or programs, curriculum development can be mandated and specified. Graduate research universities in Germany and the United States present contrasting structures on curriculum development, both in centralizing control through budget allocation and in the organization of faculty governance and their assignment of responsibility for curriculum activities and vested decision making. Decentralization of curriculum development to the internal governance of the individual university is at the extreme of centralized control, but each provides both constraints and freedom in practice and can inhibit or expand opportunities in research and curriculum for the training of researchers. German and American research universities are compared and contrasted in their approaches to curriculum development. How courses and programs are proposed, adopted and become part of curriculum patterns is examined. The influences that come to bear as constraints or driving forces in curriculum development, when governance structures are organized to favor certain parties in the process, and how this influences the teaching and research mission, are some of the principal issues raised.

W. Baur
Johann Wolfgang Goethe University
Institute of Crystallography
Frankfurt am Main
Germany

Curriculum Development in Higher Education: Coping with Newer Issues

Susan Lourenco
Tel Aviv, Israel

Curriculum development to institute changes to meet new conditions has always posed serious problems in institutions of higher education. Resistance to change from outside pressures has been a strong protective mechanism for academic freedom and the unfettered pursuit of knowledge. However, it has also protected rigidity in program and embedded traditionalism in times when societal needs have called for change if the curriculum is to be responsive to the society that provides its economic support. As one instance, the recent changes in societal family patterns which are rapidly redefining the role of women in the home and workplace, have raised a series of new issues which enter into the discussion for development of new curriculum and the incorporation into ongoing programs. For example, how best to effectively develop a curriculum for older women students which has as its chief purpose preparing them for employment in the economy? Should it be a separate program with its own instructors, cohort of students, and emphasis in choice of materials and experiences? Are there structural changes that must be made in a university to guarantee equity for those multi-cultural groups who have been bypassed in student recruitment and faculty hiring and promotion? Can these changes be made without compromising the academic and scholarly standards which have been the governing criteria for peer review of performance for hiring, promotion and retention? Are these newer issues in curriculum development revisiting long standing problems in higher education? Do the context variables simply mask persistent problems in a struggle for political power and command of resources? These are the questions that must be addressed if curriculum development is to proceed to meet the needs of emerging populations who have not participated broadly in the academic world.

S. Lourenco
16 Hei B'Iyar St.
62093 Tel Aviv
Israel
Phone: +972 - 3 - 696 - 7185
Fax: +972 - 3 - 696 - 7185

A Model for Vertical Integration of the 6-12 Chemistry Curriculum

Walter Weibrecht
University of Massachusetts, United States

In a National Science Foundation (USA)-sponsored project, teams of science teachers comprising grades 6-12 (and including several elementary school teachers) worked together to integrate aspects of the curriculum in Chemistry. The major objectives of this program were:

- to enhance individual teachers' enthusiasm for and knowledge of science and thereby their teaching effectiveness;
- to initiate and facilitate communication through the establishment of a network among teachers of different grade levels both within their own school systems and beyond; and
- to develop an interest in science and science careers among students, especially minorities and females, whose participation in scientific pursuits has traditionally been low. These objectives were met to a degree which exceeded even our own expectations.

The model which we used to accomplish these goals is outlined below.

Gifted and highly successful high school Chemistry teachers with a strong command of their subject were identified through their participation in a previous teacher enhancement workshop at the University. These teachers were drawn from a geographical area in eastern Massachusetts somewhat larger than the Boston standard metropolitan area. This impact area contains approximately three million people, roughly one-half of the state's entire population. Teachers were chosen from municipal school systems, the Boston Archdiocesan schools, and other private academies. These master teachers were asked to identify two science teachers of grades 6-12 either from their own school system or, in the case of private school teachers, from the communities from which the majority of their students came. In this way seven, three-person teams were assembled.

The participants took part in a rigourous, 15-day summer program held over the course of three weeks. Various themes common to the discipline and appropriate for all grade levels represented in the project guided our work. Water sources, distribution for use by the public, quality, and chemistry; energy and electrical power generation; light and color; and environmentally responsible handling of potentially dangerous chemical substances in industry and in the community at large formed the foundation upon which the workshop experience rested. Each theme was developed in three aspects in an effort to present not only as complete a picture as possible, but also to give the teachers a better insight into how the principles they taught their students are applied in the real world. This practical focus was a cornerstone of the project. In the development of each area, a three-part approach was used. The first part consisted of background material; the second was a site visit to either a manufacturing plant, public agency, public utility or environmental services company; and the third was a laboratory experience geared to take into consideration the time and equipment constraints extant in the schools.

The summer workshop was followed by monthly meetings during the ensuing academic year. These meetings were used to develop teaching modules, share experiences from team to team, and also to continue learning. Every effort was made to relate the subject to local concerns as a way of building interest among students. An innovative instructional model in which high school Chemistry students teach groups of middle school science students was developed. Several examples are described.

W.E. Weibrecht
University of Massachusetts
Department of Chemistry
100 Morrissey Boulevard
Boston, MA 02125-3933
USA
Phone: +1 - 617 - 287 - 6130
Fax: +1 - 617 - 265 - 7173

Effects of a Curriculum Development Model in Chemistry (Grades 6-12)

Maurice Eash
University of Massachusetts, United States

The effects of a curriculum development model directed to the enhancement of the teaching of basic chemistry grades 6-12 in a curriculum design which would improve vertical integration of the curriculum was assessed through an evaluation research design. This design tapped three sources of data to determine if the model had any impact on the teaching of the science curriculum in chemistry, especially among the teachers (hereafter referred to as "participants") who had participated in a nationally sponsored project. Students in the participants' classrooms and in a group of control science classes in the same school were administered a learning environment instrument which gathered students' perceptions of teacher behaviors that have been found to promote students' achievement. Composed of nine scales, it gathered students' perceptions of teachers' classroom performance and of students' attitudes toward science. A second source of data were supervisors of participants who were interviewed on whether there was any positive change in the participants' classroom teaching and whether there had been any spread of practice from this project to other teachers in the school. A third data source was the teachers' self-report questionnaire which was validated in the interviews with supervisors and department heads. These data have consistently found changes in the participants' classroom behaviors which improved student achievement and resulted in more favorable student attitudes toward science as a subject, as well as science as a career. An unusual finding is that more girls have become markedly interested in science as a career.

As a curriculum development model, the major effects appeared to be related to the network established between the participant teachers in the various school systems and the university chemistry professor. Of particular importance was the reduction of the feeling of isolation of the participant teachers who were trying to change curriculum practice in their schools. An extended analysis of the data and how the constructs of the model contributed to curriculum improvement is being conducted and will be included in the conference presentation.

M.J. Eash
University of Massachusetts/Boston
Graduate College of Education
100 Morrissey Boulevard
Boston, MA 02125-3933
USA
Phone: +1 - 617 - 924 - 8361
Fax: +1 - 617 - 265 - 7173

Implications of the Modular Curriculum in the Upper Secondary School

Jouni Välijärvi
University of Jyväskylä,, Finland

The structure of the Finnish upper secondary school curriculum is modular. Every subject is broken down into a sequence of modules. A key organizing principle in the modular schemes is the explicit statement of short-term goals established for the unit of study in question. Modules are self-contained and each module is assessed separately from the other modules. All modules are of the same length of study time, i.e. 38 hours.

Another unique feature of the curriculum is period-instruction. In the upper secondary school at least 14 compulsory subjects are studied by every student (age 16-18 years). One of the main purposes is to use study time in a more effective way. Concentration on a learning task is improved by limiting the number of modules studied to 4-6 at a time. Each module is allocated a minimum of five hours in the weekly timetable. The students' timetable and the modules studied are completely changed completely during 5-6 times during the school year. During the school year, there are intervals of varying length in the studies of almost all subjects.

The aim of the study was to seek answers to the following questions:

- Do the modular curriculum and period-instruction provide better possibilities for holistic learning or the learning of conceptual wholes compared to the traditional curriculum?
- How does the upper secondary school as a learning environment change as the pupil proceeds from the first to the third grade when the aim is to master cognitive wholes?
- Does the change from the first to the third grade in schools using period instructions differ from the change in schools using the traditional curriculum?

The research approach of the study can be characterized as quasi-experimental field research, which also includes longitudinal measurement. The experimental group consisted of schools using a modular curriculum and period-instruction and the control of schools following the traditional model. The data were collected by questionnaires from one age cohort (N=1387).

The study revealed that period-instruction gives a new rhythm to school work. The students have a positive attitude towards being able to concentrate on only a few subjects during a period. Regular changing of the subjects, and of teachers, brings a welcome change variety to school work and increases motivation especially at the beginning of a period.

However, only a few statistically significant differences were found between the experimental and the control group. Differences between the first (on the first grade) and the second measurement (on the third grade) were systematic and highly significant in both groups. Prerequisites for comprehensive and deep-processed learning were estimated to be poorer in the last grade of the upper secondary school. The inner goal-directedness and personal significance of school work were experienced as less important by the end of the upper secondary school. Atmosphere in the school was found to have become more negative.

A modular curriculum and period-instruction merely as new ways of organizing teaching time are not alone able to reform the learning environment. The problem of teacher-centred teaching, which is still largely based on the textbook, may even increase when instructional time is heavily concentrated. For instance, double lessons have been considered problematic. Problems also arise as pupils forget between periods what they have learnt before. The modular structure offers more possibilities to reorganize the whole curriculum of secondary education. Also within an individual upper secondary school, the modular structure allows teachers to modernize the curriculum of their own discipline one module at a time. On the other hand, there is a danger of increased fragmentation of a module is not carefully considered in the context of the whole discipline. The modular structure allows a student to construct a personal programme of his/her own in a flexible way. However, this requires that the national syllabus for the upper secondary school is much more flexible than is the case at present and allows a greater number of free choices of the modules.

Changing instructional arrangements does not guarantee desired changes at the level of the classroom. An important thing is the activation of teachers and students to develop their own methods. The presupposes not only a profound reassessment of the role of a teacher as a supervisor of the learning process. Attention should be paid to integrating the structure and contents of the curriculum, to modernizing learning tools and above all to reforming the matriculation examination.

J.E.Välijärvi
University of Jyväskylä
Institute for Educational Research
P.O. Box 35
SF-40351 Jyväskylä
Finland
Phone: +358 - 41 - 603271
Fax: +358 - 41 - 603201

Evaluating Curricular Decisions among Teachers and Schools

Juan Rué
University of Barcelona, Spain

The research evaluates the main trends of the curricular offer in the variable courses of studies (variable credits) in four schools, where the new compulsory secondary school has been experimentally implemented. Data analysis shows disparity among these institutions which can be explained by an unpredictable interaction between different kind of parameters. The structural ones: to be government or private schools, the constitution of the staff and of the infrastructure and available resources; and the symbolic ones: institutional meanings shared by the staff, the emergent meanings caused by the properties and functionality of the particular organizational model and the way the curriculum is developed, and those meanings created in the frame of the teacher's personal and instructive behaviour.

Causal analysis of these conditions cannot provide successful explanations about these features, or about the construction process and the development of a particular curricular offer.

The methodology was based on case analysis. Data gathered during the academic years of 1990-91 and 1991-92 coming from the following sources: institutional documents and school documents about the curricular variable offer; interviews to Principals, Deputy heads, Department heads of the four schools; interviews to the teachers working in variable credits; interviews to classroom tutors and to a sample of pupils; and a survey on a sample of the academical files of 18 pupils from each school.

The research had been focusing mainly on the self perception of the involved subjects (directive teams, teachers and pupils) in the process of the design and the implementation of that specific curricular sphere in order to understand in each centre the main properties of the offer and to understand why we found differences among those institutions.

Even if we would contemplate the curricular offer of these four schools as an equivalent and accommodated to their pupil's characteristics, due to its particular social and cultural milieu properties, a more comprehensive analysis shows how the differences were not so important at the level of the "basics", i.e. the appropriate presence of each of the academical areas in the different curricular section, but at the level of the philosophy and orientation of the offer, which had "hidden paths" or curricular functions self attributed by teachers themselves or school teams to the subjects and courses.

Cultural, academical, professional and group parameters were influencing the specificity of the school culture and the shared meanings by the different teacher teams, who had an extraordinary influence among the way that curricular option was focused and displayed in each school, and on the way that this side of the curriculum was articulated with the subjects and common credits for all the pupils. It is in that frame where we focused on the meaning of the reproduction of the selective curricular culture or its transformation in the frame of what the comprehensive school does really mean.

As general conclusions, we would emphasize the following:

- The adequacy of the variable part of the curriculum to the diversity of pupils' interests, motivations and abilities, in order to encourage their promotion in the educational system, appears related to the centre's policies. In spite of these data, formative paths in each school do not seem to be specialized enough to limit the educational possibilities of the pupils' academical future. Curricular optionality, instead, as being closer to the pupils, seems to generate an important motivational function.
- In all the schools, but with different degree, gender differences appeared as a cultural obstacle limiting the female's access, especially to the technological culture, and restraining males' interests from the reproductive and artistic culture. Nevertheless, we found that in a significant part of the optional curriculum there was equitable access for both sexes to the different cultural fields.
- The school decisions depended, on their more relevant issues, on the teachers thinking as individuals, who adopted their own academical education and experience as main decisions framework. After that, they considered too their intuitive perception about their pupils' educational needs.
- Tutors, men and women, acted and decided under the frame of the requirements of their centre in order to promote a positive pupils curricular diversification. But they did act without enough resources, as time or information, and their influence on pupils' decisions appeared as barely important.
- Pupils appeared as self conscious and autonomous about the management of their curricular optionality. They interacted and exchanged information or experiences with peers, when taking decisions was necessary, within the frame of the self diagnosis of their own interest, needs and personal requirements and managing their (scarce) resources, as time and personal effort, in order to get their own academical progression.
- The opportunities and innovative potential that introduced this curricular section were highly appreciated by pupils and teachers, who considered it as more dynamic, interesting, practical, motivating, and promoting more opportunities to interact and to communicate to each other than courses in the common curriculum. In spite of these reasons, the most appreciated were the following viewpoints: the smaller size of class groups or the total amount of time of the courses (between 20-30 hours each).
- The parameters affecting the orientation and the quality of the curricular optionality were: institutional ownership, academical structure and history, teachers staff feature, organizational management of the pupils information and decision taking process, the tutorial functions related to that, and school social and cultural milieu.
- Among the different schools, cultural and symbolic parameters emerging from the domain of the educational team, appeared to be the most decisive in determining a particular curricular offer configuration, and in its bias or in its differentiation. It is in this domain where we can look for the answer to the phenomena of reproduction of the selective school culture through the core of the comprehensive school curriculum.

J. Rué
University of Barcelona
Department of Educational Sciences
Edifici G
08193 Bellaterra
Barcelona
Spain
Phone: +34 - 3 - 5812397
Fax: +34 - 3 - 5812000

Curriculum Evaluation in the Netherlands and Educational Productivity

Wijnand Hoeben
University of Groningen, the Netherlands

In this paper reports on Dutch curriculum evaluation of the last ten years are reviewed in order to examine their contributions to what we know of educational productivity, especially the productivity of the curriculum. In the Netherlands during the 1980s educational evaluation in general, and curriculum evaluation in particular moved from a predominantly process oriented perspective towards a more output oriented perspective. Purposes of curriculum evaluation changed from illuminative and formative evaluation towards more rigourous and summative evaluation. The testing of hypotheses on the educational outcomes became common practice, thereby contributing to what we know of and elaborating on notions of educational productivity. The beginnings of this shift were identified in a previous review (Creemers & Terlouw, 1984).

To guide the review a conceptual model is outlined, that combines notions of curriculum impact with models of productivity (Hoeben, 1993; Hoeben, van den Akker & Terwel, in press). Earlier versions of the conceptual model were used to review curriculum development in the Netherlands (Creemers & Hoeben, 1987), to formulate desiderata of the design of evaluations (Hoeben, 1987) and to derive quality indicators of curricula (Hoeben, 1992). The model is specified for the elements of educational productivity which frequently are part of the hypotheses to be tested in curriculum evaluation. The model specifies variables at student level, variables of curriculum implementation, variables of the curriculum documents, and variables of the schools' and teachers' effectiveness.

The relevant evaluation reports that are reviewed, fall in three categories. Firstly the reports on Dutch projects participating in the international studies in educational achievement of IEA are reviewed, especially those on school mathematics, science and classroom environment. The second type of evaluation consists of the recurrent assessment studies of arithmetic, mother tongue, English, science/social subjects and traffic education in primary schools. The recurrent assessment studies are conducted in the Netherlands since the middle of the 1980s. Summative, frequently comparative evaluations of specific curricula and textbooks in different subjects are the third kind of study that is reviewed. The three kinds of studies have different selections of variables at student level, at implementation level and at curriculum level. Most studies have been very selective and used different criteria as to the inclusion in their design of variables of curriculum documents, of the schools' effectiveness and of the teachers' effectiveness.

Based on the results of the curriculum evaluations their contribution to the accumulation of knowledge on productivity is appraised. The evaluation reports confirm the basic notion that the most important productive factors may be found at the student level, especially their learning ability and their application to learning. Most reports confirm the productive contribution of two important variables of curriculum implementation, i.e. the students' opportunity to learn the content of the curriculum and the time they spend on learning. Several reports confirm the importance of evaluation and feedback in the implementation of the curriculum. Due to the selectiveness of evaluation studies it is more difficult to identify trends regarding the variables of curriculum documents, of the schools' effectiveness and of the teachers' effectiveness.

Consequences for the design of curriculum evaluation studies are formulated. The paper concludes with a discussion on the fruitfulness of a systematic incorporation of notions of educational productivity in the routines of curriculum evaluation.

W.Th.J.G. Hoeben
University of Groningen
Institute for Educational Research
P.O.Box 217
7500 AE Enschede
The Netherlands
Phone: +31 - 50 - 636645
Fax: +31 - 50 - 636670

Implementation of Environmental Education: Evaluation of a National Project

Karel Stokking
University of Utrecht, the Netherlands

Abstract

In December 1990 the national government of the Netherlands started a four year project (1991-1994) to implement environmental education (EE) in all schools, of all sectors: primary, secondary, vocational and agricultural education. The main goal is to achieve "structural embedding" of EE, both in the school policy and in the school subjects. The content of EE is left open. The main guideline, according to the plan of the 6 participating departments (The ministries of Education; Agriculture, Nature Conservation and Fishery; Health, Planning and Environment; Transport and Communications; Economics; and Developing Cooperation) is to map the needs of the schools ("bottom up" or "pull" strategy).

In 1992 the management of this innovation process was put into the hands of four sector managers and a general process manager. Their strategy was, to give schools and all sorts of organizations for environmental education, curriculum development, school consultancy, and the like, the opportunity to submit project proposals.

By the end of 1993 a total of 270 projects in all sectors had been granted a subsidy. The four year total budget is Hfl 78.000.000.

In January 1993 the Department of Educational Research of the University of Utrecht was asked to design and perform a research project to evaluate this innovation process. The evaluation takes place on three levels:

- the national policy and the strategies of the sector managers;
- the execution and results of the (different types of) granted projects;
- the adoption, development, implementation and incorporation of EE in the schools and by the teachers.

The design includes surveys, for all the projects and for samples of schools, using written questionnaires (fall 1993, fall 1994, spring 1995); case studies, interviews and observations of selected projects and schools (spring 1994, winter 1995); analysis of relevant documents; and assessment of curricular products by experts.

The paper will describe the first evaluation results in the sectors of primary and secondary education. In particular, the following questions will be discussed:

- the effectiveness of a curriculum implementation policy in which the content is left open, and the extent to which the content of EE actually is open;

- the ways in which the granted projects really try to satisfy the needs of schools and teachers, and, in addition, the nature of these needs;
- the variety in which schools and teachers practice EE and the possibilities to relate this to the different types and strategies of the granted projects;
- factors and conditions which affect the EE implementation process;
- the differences between primary and secondary schools, and the idea of a longitudinal EE curriculum, in relation to what is known about the knowledge, values, attitudes and behaviour of children and youngsters.

E.M. Stokking
University of Utrecht
Dept. of Education and Educational Research
Heidelberglaan 2
3584 CS Utrecht
The Netherlands
Phone: +31 - 30 - 534785
Fax: +31 - 30 - 532352

Evaluation of Teaching Packages for Technology Education

Gerard Doornekamp & Jan Streumer
University of Twente, the Netherlands

Introduction

In August 1993 in the Netherlands, a new system of education has been implemented in the first stage of secondary education, called 'basic education', a common curriculum for the first two or three years of secondary education. Fifteen subjects, among others Technology Education, are taught in 'basic education' to children with different achievement levels.

The National Institute for Curriculum Development (abbreviated in Dutch: SLO) has developed, besides a new National Technology Education Curriculum, several teaching packages for Technology Education, in cooperation with schools for secondary education.

Problem solving is one of the major aspects of these teaching packages and is defined as a structured method of solving technical problems, with a step-wise approach by means of questions, followed by a practical execution of the solution of the problem.

Problem

When the teaching packages were developed, no attention was paid to the various achievement levels and the attuning of instructional procedures to those levels. But, according to Kudrjavcev and Matjuskin (in: De Jong, 1989), the situations in which problems have to be solved, have to be attuned to the achievement level of the learner. This can be done by varying the degree of specification in the instructional procedures, e.g. by adding extra directions, aimed at the development of metacognitive skills.

Next to the specification of the instruction, student characteristics, like gender and and intelligence (in particular spatial orientation, technical orientation and field-(in)dependence) appear to influence the problem solving process (Van der Sanden, 1986).

The SLO is in need of a formative evaluation of the teaching packages and is especially interested in the question how variants of teaching packages (in particular those parts that refer to problem solving), attuned at the various levels of students in basic-education, can be designed.

The PSIT-project

In 1993 the research project 'Technology Education in Secondary Education: Problem Solving in Teaching Packages' (abbreviated as the 'PSIT'-project) was carried out by the Centre for Applied Research in Education (OCTO) of the University of Twente.

The research project focused on the formative evaluation of variants of teaching packages concerning construction-problems and explanation problems. For these two types of problems two variants of teaching packages were developed: one with detailed instructional procedures (detailed drawings and pictures, list of parts to be used, design examples) and one with non-detailed instructional procedures. In this way answers could be given to two research questions:

- In what respect does variation of instructional procedures (detailed vs. non-detailed) influence the students' technical problem solving?
- In what respect do student characteristics (e.g., achievement level, gender, intelligence) influence their technical problem solving when a certain instructional variant is applied?

By means of an experiment according to the independent group design these questions were answered. Students of junior vocational and junior general secondary education and students of senior general secondary and pre-university education participated in the experiments (in normal classroom settings).

After the introduction of the problem by the experimenter, each participating class was split up into two equal groups. One group got the detailed and the other group the non-detailed instructional variant. During 90 minutes the students had the opportunity to solve the problem individually by carrying out four practical assignments. Each student had the disposal of a box with construction materials (FisherTechnik). During the execution of the practical assignments the activities of a student were marked every minute by an observer on an observation scheme. The observer also noted the starting time and the final time of each practical assignment.

Student characteristics were assessed with several instruments. A Student Questionnaire was used to gather information about the students' gender, age, ethnic background, etc. The spatial orientation and the technical orientation were assessed with the subtests 'Space Relations' and 'Mechanical Reasoning' of the revised Dutch version of the Differential Aptitude Test (Evers & Lucassen, 1991). The Group Embedded Figure Test (Witkin, Oltman, Raskin & Karp, 1971) was used for the assessment of field (in)dependency.

Results

In fact two studies were done: one with the teaching packages about the construction problem (n = 305 students); and a second study with the teaching packages about the explanation problem (n = 295 students).

Summary of results of the teaching packages about the construction problem

50% of the participating students were from junior vocational education/junior secondary education; the other half came from senior general secondary education/pre-university education. The same division applied to gender: 50% boys; 50% girls.

Students were equally divided onto the two instructional variants. Girls had significant lower mean scores on the three intelligence tests than boys.

Students from junior vocational and general secondary education scored significantly lower on the intelligence tests than students from senior general secondary and pre-university education. Those differences did not exist between students who used the detailed instructional variant versus students who used the non-detailed version (if the aforementioned divisions are not made).

The scores of the practical assignments were made up of (1) the total amount of time used for doing all the assignments and (2) the quality of the solution (based on an analysis of the final product).

Girls students using the detailed instructional variant, and students from senior general secondary and pre-university education scored significantly higher (needed more time!).

Boys scored significantly better on the quality of the final product.

Summary of results of the teaching packages about the explanation problem

- Again boys and girls were equally (50%) divided onto the total population and onto both conditions (detailed instructional variant; non-detailed instructional variant).
- 55% of the students belonged to the category junior vocational/junior general secondary education; the remainder belonged to senior general secondary education/pre-university education.
- Girls had significantly lower mean scores than boys on two of the three intelligence test (the Group Embedded Figure test formed an exception: girls had lower scores, but not significantly lower).
- Students from senior general secondary/pre-university education did a better job as far as the intelligence tests than the remainder of students; they scored significantly higher. Overall, no significant difference existed between students participating in the two instructional variants.
- Girls, students from senior general secondary/pre-university education and students using the non-detailed version scored higher than the other groups of respondents (consumed more time!).
- Boys and students using the detailed version of the instructional variant, scored significantly higher than girls, respectively students using the non-detailed version, which indicates that their products were appreciated more (higher quality).

B. Doornekamp
University of Twente
Centre for Applied Research in Education (OCTO)
P.O. Box 217
7500 AE Enschede
The Netherlands
Phone: +31 - 53 - 893586 / 893603
Fax +31 - 53 - 315099

J. Streumer
University of Twente
Faculty of Educational Science and Technology
P.O. Box 217
7500 AE Enschede
The Netherlands
Phone: +31 - 53 - 893603
Fax: +31 - 53 - 329136

Quality Assurance in Assessment of Student Outcomes by Teachers

Chair: Wynne Harlen,
Scottish Council for Educational Research, Scotland

Introduction

There will be three papers in this symposium:

- Quality assurance and quality control in student assessment: purposes and issues (Harlen)
- Quality assurance, teacher assessments and public examinations (Daugherty)
- Experience of quality assurance in statutory assessment and testing of young children (James)

These papers are written to address the symposium theme and to complement one another. The theme of the symposium is how assessment by teachers, (internal assessment), can be made more reliable.

There are two central pillars to the claim that, for a number of outcomes of education, internal assessment is essential for worthwhile evidence of achievement. One of these concerns the influence of context on performance. It is well established that assessment is highly context-specific and generalisation is a perilous undertaking. Tests, whether internally or externally set, can provide only a limited number of tasks and thus a small sample of a particular skill or ability from which to generalise. Moreover, the interaction with particular contexts of personal factors such as motivation means that providing the same tasks for all is not necessarily providing equal opportunity. Internal assessment which can gather evidence from performance in a wide range of tasks, indeed as wide as the range in which teaching and learning takes place, provides a much larger sample of performance and thus a more valid basis for judging a student's achievement.

The second point about the validity of internal assessment relates to the recognition that central to the aims of education are the development of mental and physical skills, values, attitudes and applicable knowledge and understanding as well as mastery of a traditional and enduring body of knowledge. National curricula and examination syllabuses make such objectives explicit. Assessment for whatever purpose must reflect this broad range of aims and must, therefore, provide opportunities for students to show these skills, attitudes and abilities. Externally set tasks are unlikely to provide appropriate opportunities. Not only is it in many cases logistically impossible to do so within the constraints of an externally set task but often it is logically impossible to assess by such means, for example, the ability to work cooperatively, or to apply knowledge in tackling unexpected problems in a study or project. It is only in teacher-based assessment that appropriate and valid tasks can be provided for abilities such as these.

However, any assessment cannot have a high validity unless it is also highly reliable, since otherwise it would give varying results if repeated and it would be unclear just what was being assessed. But also it is difficult to have high reliability *and* high validity, since the requirements of high reliability lead to close specification of task, response mode, means of gathering information and interpretation and these are often incompatible with high validity. However, the matter of reliability must be faced, for an unreliable assessment is not only of little use but can be unjust. The endeavour to increase reliability is common to all methods of assessment. The means of achieving this is through procedures which until recently were described as various forms of *moderation* but which are now more commonly referred to as quality assurance or quality control.

Although the problem motivating the papers in this symposium is based in the educational systems and experience of the UK, we believe that the arguments and evidence will inform debate about assessment in other countries. For wherever problems in assessment practice are faced, and particularly where changes are towards broadening beyond traditional forms of tests and examinations, to encompassing skills and knowledge application rather than knowledge recall and to criterion-referencing, then the issues discussed here will arise.

Quality Assurance and Quality Control in Student Assessment: Purposes and Issues

Wynne Harlen
Scottish Council for Research in Education, Scotland

Introduction

This paper gives an overview of methods of moderation, or quality assurance and quality control, as they may be more widely known, which are used to enhance the quality of student assessment. In discussing the prior issue of what is meant by *quality* in assessment, a case is made for the importance of assessment by teachers as opposed to external assessment in the form of examinations or tests set and marked by external testing and examination agencies.

When so much rests on the assessment of pupils as it does today, the dependability of the assessment is of vital importance. The term 'dependability' is used to embrace both reliability and validity, since there is no point in having one without the other; but neither can both be 100%, for reasons which are addressed in the paper.

Proposition

In seeking the appropriate balance in relative emphasis on reliability and validity, the context and the purpose of the assessment have to be borne in mind. A highly reliable assessment but one which is time consuming or demanding of resources will be of little use to a teacher who wants information about pupils on a regular basis with minimum interruption of normal work. In such circumstances *quality* in assessment means an assessment made and interpreted on the spot which provides the type of information required (high validity) and with the greatest degree of reliability possible in the circumstances. The intended use of the information in this case means that reliability is not the foremost consideration. However, had the purpose been to provide an assessment of course work as a contribution to an external award, the burden on reliability could be greater. In both cases, however, the value depends on the ability of the teacher to gather and interpret the information with the required rigour and respect for evidence. Good assessment thus depends on the use and development of these skills. These sorts of consideration lead to the proposition that *quality in assessment is the provision of information of the highest validity and optimum reliability suited to a particular purpose and context.*

Criteria

The quality of all kinds of assessment must, we believe, be judged by the same criteria and based upon evidence rather than assumption and tradition. Yet the UK is not alone in operating on the assumption that externally set tests are necessarily more dependable than internal assessment carried out by teachers. Recently there has been in England and Wales a quite explicit downgrading of assessment made by teachers, which is in sharp contrast to the confidence in teachers' assessment, shown, for example, in Germany. Low reliability is not an inherent failing of teacher-based assessment. At the same time it is recognised that teachers' assessments are sometimes more unreliable than would be the case if more resources were used to research the reasons and support measures to improve procedures.

Moderation procedures

Moderation procedures used for all kinds of assessment and testing are considered in two groups: those concerned with quality assurance and those concerned with quality control. These overlap since the distinction between a quality assurance procedure and a quality control procedures does not reside inherently in the nature of the procedure; the categorisation must be made in terms of the purpose and effects of the procedure. Very briefly, the main procedures are:

- Approaches to quality control in assessment;
- Use of reference or scaling tests for statistical moderation;
- Inspection of samples by post;
- Inspection of samples by visiting moderators;
- External examining;
- Teacher requested moderation (appeals);
- Group/consensus moderation of internal assessment;
- Approaches to quality assurance in assessment;
- Defining criteria for assessment;
- Exemplification;
- Approval of institutions/centres;
- Visits of verifiers or moderators;

- Group moderation.

The paper compares these in terms of relevant characteristics and features such as cost, time-demand and impact on the process and product but considers it important to take into account the impact on professional development, since moderation must be concerned with all parts of the assessment process, from planning to product and with what is in the teacher's mind as well as with public procedures.

W. Harlen
Scottish Council for Educational Research
15, St. John Street
EH 88 JH Edinburgh
Scotland
Phone: +44 - 31 - 5572944
Fax: +44 - 31 - 5569454

Quality Assurance, Teacher Assessments and Public Examinations

Richard Daugherty
University of Aberystwyth, Wales

Introduction

Assessments by teachers have, until recently, made an increasingly significant contribution to the grades awarded in national examinations in England and Wales. This has been especially true of the General Certificate of Secondary Education (GCSE) which was introduced in 1986 as the main form of certification of courses for the 14- to 16-year-old age group. Building on earlier work in the examinations it replaced, in particular the Certificate of Secondary Education (CSE), the GCSE was established as an examination in which at least twenty per cent of the credit towards the overall grade would derive from work ('coursework') undertaken by students during their course of study and marked by their own teachers.

Current developments

Within Government guidelines, examining boards were initially permitted to develop syllabuses and assessment schemes in which up to one hundred per cent of the marks obtained by students were awarded for coursework tasks, the actual proportions varying across subjects and examining boards. However, changes in Government policy since 1991 have brought a reduction in the extent to which GCSE grades depend on coursework. Some of these changes can be associated with a shift to the political Right in education policy but the period since 1986 has also seen teachers and other education professionals questioning the reliability of coursework assessments. Doubts have been expressed as to the adequacy of the procedures used by the examining boards to bring about alignment of standards ('moderation') across the many teachers and schools engaged in planning, managing and marking GCSE coursework.

This paper traces the changing status of teachers' assessments in the GCSE, reviews the range of current moderation methods and draws on a small number of empirical studies to identify some key dimensions in the development of quality assurance systems for coursework assessment.

R.A. Daugherty
University of Wales
Department of Education
King Street
Aberystwyth
SY23 2AX
United Kingdom
Phone: +44 - 970 - 622104/5
Fax: +44 - 970 - 622258

Experience of Quality Assurance in Statutory Assessment and Testing of Young Children

Mary James
Cambridge Institute of Education, England

Introduction

This paper develops some of the themes introduced in other papers in this symposium by exploring recent experience of moderation and audit in the context of national curriculum assessment (NCA) in England. In particular it looks at ways in which local education authorities (LEAs) and schools in the East Anglian region have responded to the national requirement to develop effective systems of quality assurance and quality control in relation to the new statutory arrangements.

Quality assurance structures and procedures

For reasons partly to do with the phased introduction of the national curriculum, partly to do with the different characteristics of education at the various Key Stages (the age-related units into which the national curriculum is divided), and partly, one suspects, for political reasons, the quality assurance structures and procedures that have been tried out to date exhibit considerable differences across Key Stages. At Key Stage One (KS1), for 5 to 7 year olds, a system of 'moderation' involving teams of visiting moderators appointed by local education authorities backed up by local assessment training, was established in 1991, ahead of the other Key Stages. Thus, the most extensive experience of quality assurance procedures in relation to NCA is, to date, to be found in schools catering for 5 to 7 year olds. This paper, therefore, takes as its particular focus an examination of the accumulating evidence of experience at Key Stage One in order to offer some answers to questions about the confidence that can be placed on the results of statutory assessments conducted within schools and the costs and benefits of the systems established to enhance consistency.

Research studies

The paper draws on what are believed to be the only independent research studies, specifically of moderation practice in the national curriculum, available at the current time. These constitute four consecutive research and evaluation projects carried out by researchers at the University of Cambridge Institute of Education and funded by LEAs in East Anglia.

The first study was an evaluation of KS1 assessment training in Bedfordshire in 1991 during the first run of NC assessment in the 'core' subjects (English, mathematics and science) for all children in Year Two (Y2). The research involved observation of assessment training sessions and the conduct of the 1991 assessments in schools supported by interviews with LEA advisers, moderators and teachers.

The second study, in 1992, involved four LEAs (Essex, Hertfordshire, Norfolk and Suffolk) and focussed specifically on moderation and the obligation placed upon LEAs by central government to promote consistent standards of assessment within and across LEAs. The data were again collected through observation of training sessions but also by 'shadowing' moderators as they carried out their tasks. Accompanying moderators on their visits to schools also provided opportunities to observe and talk with teachers.

The third study continued to monitor assessment practice in schools and LEAs in the light of the 1992/93 KS1 Assessment Order (the statutory regulations issued by central Government) and to extend the analyses generated by the research undertaken in 1992. In 1993 however the group of LEAs was extended to six (Bedfordshire, Cambridgeshire, Essex, Hertfordshire, Norfolk and Suffolk). In order to counteract any bias that might have been introduced in the earlier study, by shadowing moderators and taking LEA arrangements as a starting point, a decision was taken to make case studies of schools (two or three schools in each LEA) the primary focus of this research. This change in approach was also a response to the shift in emphasis introduced by the Department for Education

(DFE Circular 12/92) which gave headteachers a statutory duty to see that their schools' assessment standards conformed to national standards.

The fourth study, in 1994, again funded by the six East Anglian LEAs, continues the themes and issues surrounding moderation but takes yet another perspective by focussing more particularly on LEA policy and the structures and procedures that have been developed in an effort to assure intra- and inter-LEA consistency. Taken together these four research projects provide a multi-faceted, longitudinal study into the ways that LEAs and schools have tackled their responsibilities with respect to quality assurance at Key Stage One since statutory assessment began.

Conclusion

Collectively, these studies lead to a conclusion, that, although substantial problems remain, schools and LEAs in the East Anglian region, and perhaps elsewhere, have moved towards greater consistency of approach. Indeed there is evidence of an emerging model of quality assurance at LEA and school level which has the following features:

- the provision by the LEA of assessment training for both teachers and moderators and the establishment of helplines for trouble-shooting;
- the provision, at school, LEA and inter-LEA level, of regular planned opportunities for debate about judgements in relation to children's work (agreement trials);
- the development of resource banks of 'standard' assessment tasks for use by teachers, to support their own assessments of children's performance, when they deem it appropriate;
- school visits by moderators (appointed by LEAs to support schools in the process of making their judgements) to contribute to the development of a consistent approach and to sample lightly the assessments made;
- the development of individual portfolios of evidence of each child's attainment containing a limited number of annotated pieces of work to illustrate that the processes of assessment have been carried out competently;
- the development of school portfolios of evidence of the teachers' judgements of children's work at the various levels so that parents, moderators and others can be assured of the quality of assessments;
- the development of equivalent LEA portfolios of children's work to provide exemplar material to support the development of consistent judgement across teachers and schools.

Finally, it is argued that the emergence of a professional model of quality assurance at local level has the potential to fulfil both the development and accountability purposes which are claimed for assessment, although the difficulties in achieving an acceptable balance between these goals is acknowledged. Most crucially, the evidence suggests that the attempt to introduce a system of quality assurance in schools is equivalent to bringing about cultural change and must, therefore, be framed according to a time scale and with attention to the human dimensions that cultural change entails. To regard putting in place a quality assurance system as little more than a technical or bureaucratic exercise involving the design of structures, the delineation of roles and the distribution of resources is to court the kind of reaction that led to the boycott of national testing arrangements by all the major teachers' unions in 1993 and the continued union action by some teachers in 1994.

M. James
University of Cambridge
Institute of Education
Shaftesbury Road
Cambridge
CB2 2BX
United Kingdom
Phone: +44 - 223 - 69631
Fax: +44 - 223 - 324421

Functions of Content Standards in Russia, England and the Netherlands: a Comparative Analysis

Joke Voogt & Tjeerd Plomp
University of Twente, the Netherlands

Content standards

An educational standard formulates the goals, attitudes and skills which are aimed for in education. Educational standards can be formulated for a specific subject matter domain (content or curriculum standards) as well as for schools and school systems as educational delivery systems. The study reported here primarily focuses on content standards that are formulated for the lower secondary curriculum in three countries, viz. Russia, the Netherlands, and England and Wales.

In Russia this refers to content standards for the nine-year school, in the Netherlands this refers to core objectives for a recent implemented innovation, Basic Education, and in England and Wales this refers to the development of attainment targets in the framework of the National Curriculum.

Study

The purpose of the comparative study is to contribute to the discussion in Russia about the development and functions of content standards through comparing recently formulated (partly draft) standards of the three countries mentioned above. The study limits itself to an analysis of the documents that describe the curriculum (rationale, content and structure), the formal curriculum. Next to a general analysis, the content of Mathematics and English as a foreign language has been analyzed specifically.

For the analysis formal documents referring to core objectives for Basic Education (the Netherlands) and the National Curriculum (England & Wales) were collected. As the development of content standards in Russia took more time than was expected, for Russia only the general documents on content standards were formally approved (including the rationale and a time table for the distinguished subject matters). Content Standards focusing on specific subject matters are still being developed by different groups (sometimes competing with each other, sometimes cooperating). For the analysis of Mathematics and English therefore the draft documents of promising scientific groups were analyzed.

The analysis is based on a detailed scheme, partly derived from a more general analysis on education standards carried out by the OECD (1993). The scheme included for the general part of the analysis components, such as nature and purpose of content standards, development of content standards and relation between content standards and assessment. For the specific part on Mathematics and English the scheme included the components rationale, general goals, domains covered and time allocated.

Results

Content standards are accomplishing several functions for the educational system, such as guidelines for curriculum developers and textbook authors, for examination developers, for schools to organize the teaching-learning processes and for policy makers as an instrument in monitoring quality of education etc. The results of the analysis show that countries differ in the functions that turned out to be of primary importance. Functions of content standards appear to be very much related to the definition of content standards, their level of specificity, the intrinsic value for certain target groups and their legal status.

In the paper the relation between the principal functions of content standards in the three countries involved and the formulation and structure of content standards will be discussed.

J.M. Voogt
University of Twente
Faculty of Educational Science and Technology
P.O. Box 217
7500 AE Enschede
The Netherlands
Phone: +31 - 53 - 893559
Fax: +31 - 53 - 329136

Tj. Plomp
University of Twente
Faculty of Educational Science and Technology
P.O. Box 217
7500 AE Enschede
The Netherlands
Phone: +31 - 53 - 893595
Fax: +31 - 53 - 329136

Tension between Cultural Restoration and Nation Building in the Nationalised Welsh School Curriculum

Michael Williams & Brinley Jones
University College of Swansea, United Kingdom

The Education Reform Act of 1988 introduced to England and Wales a prescribed National Curriculum. For Wales it legislated for the establishment of the Curriculum Council for Wales with a remit which included reviewing the National Curriculum, advising central government and publishing and disseminating information relating to the curriculum for schools. This agency had a similar brief to the National Curriculum Council which was to serve England. In this paper we trace the evolution of curriculum policy in Wales through the statutory curriculum Orders published by the Welsh Office and the publications offering non-statutory guidance published by the Curriculum Council for Wales, focusing our attention on the concepts of cultural restoration and nation building.

One of the earliest publications of the Curriculum Council for Wales (1991) was concerned with the whole curriculum. Unlike the parallel publication in England (National Curriculum Council 1990) this set out a clearly defined framework for the whole curriculum in Welsh schools. It was based on a list of 'aspects of learning' which was drawn from the 'areas of experience' which had appeared in publications of Her Majesty's Inspectorate in England in the 1970s as part of the 'Great Debate' about the curriculum. It was to provide the rationale for a series of publications which set out to define the distinctive features of the Welsh curriculum.

We describe briefly the relevant features of publications concerned with the development of cross-curricular themes in primary and secondary schools leading up to the publication in 1993 of a report on 'Curriculum Cymreig'. This report was an attempt to define succinctly the 'Welshness' of the school curriculum and the cultural ethos of schools. It was enhanced by the publication of a set of case studies which described how 'Welshness' was defined in a selection of primary and secondary schools (Jones & Lewis, 1994).

What emerges from this review is an attempt by a number of Curriculum Council for Wales working parties to bring about a balance between a nostalgic view of Welsh culture and a more futuristic view. We analyse these two views in the context of the discussion about curriculum policy making which emanates from the writings of a number of theorists including Ball in England (e.g.1990 and 1993), Giroux and McLaren in the USA (1989) and Kenway in Australia (1990). The focus of these authors has been on the role of the New Right in policy making with reference to curriculum, assessment and pedagogy. They are critical of what they perceive as the jingoistic, nationalistic arguments which have been used to justify curriculum reform in their respective countries.

A central concept in the writing of radical theorists is 'cultural restoration', the attempt to rationalise changes on the basis of experience of previous school and curricular arrangements. We discuss this concept from the perspective of curriculum reform in Wales. In particular we highlight the arguments for introducing a strong Welsh dimension in the curriculum contained in an influential inter-war official publication of 1927 (Committee of the Board of Education) These arguments are discussed in the context of the debate about the nature of contemporary nationalism in Europe (e.g. Hobsbawm, 1990, and Ringrose & Lerner, 1993). This debate focuses on the past and future of nationalism and nation states and is fruitful for clarifying the concepts of cultural restoration and nation building. The debate is enriched by a consideration of national identity and self-identity, aspects of social development which have been explored in recent sociological texts (e.g. Giddens, 1991, and White 1992).

We examine the role of schools in nation building and the importance of the curriculum in arousing national consciousness and promoting national citizenship. We consider the relevance of national identity and pupil empowerment in the context of a nationalised curriculum in Wales and conclude by extending the discussion briefly beyond the Welsh context to other parts of Europe.

M. Williams
University College of Swansea
Department of Education
Hendrefoelan
Swansea SA2 7NB
United Kingdom
Phone: +44 - 792 - 201231
Fax: +44 - 792 - 298499

B. Jones
University College of Swansea
Department of Education
Hendrefoelan
Swansea SA2 7NB
United Kingdom
Phone: +44 - 792 - 794806
Fax: +44 - 792 - 298499

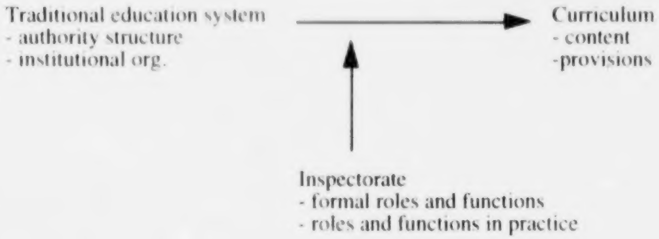
The Inspectorate and the Quality of the Curriculum: Developments in Eastern Europe

Hanneke Braaksma
University of Twente, the Netherlands

As most education systems, eastern European education systems used to have and still have inspectorates. In most education systems inspectorates are expected to contribute to the quality of education in one way or another. How they do this in practice depends very much on the tradition of the education system concerned and especially on the authority structure of it.

An important element regarding the quality of education systems is the curriculum. Following Pelgrum (1989) an intended, an implemented and a realised curriculum will be distinguished. The intended curriculum is the one which is to be found in legislation and other regulations; what this curriculum looks like depends very much on the authority structure and the institutional organisation of the education system. The implemented curriculum is the one which can be found in materials and equipment used in the educational process, what and how teachers teach etc. In short: the provisions. The realised curriculum is the one which is found through evaluation of what is actually learned. The realised curriculum will remain beyond the scope of this paper.

These considerations are shown schematically in the following model:


Traditional education system
- authority structure
- institutional org.
Curriculum
- content
-provisions
Inspectorate
- formal roles and functions
- roles and functions in practice

The main question dealt with in this paper will be how inspectorates contribute to realising new checks and balances regarding the curriculum in former eastern European education systems. In order to begin answering this question a comparison will be made between the former GDR system and the education system of Russia. This will be done by studying literature as well as information collected during visits to Germany and Russia.

Both former education systems can be characterised as firmly centralised systems in which a detailed prescribed curriculum was realised. Since 1989/1990 much is changing in this respect. The concept of decentralising educational policy-making and administration seems to be flourishing in both countries. The curriculum is no longer prescribed in detail neither seems it to be controlled firmly nowadays. Questions regarding the quality of education have to be faced given these new circumstances. As a consequence roles and functions of inspectorates have to change.

An interesting difference in the circumstances of change is that in Germany the former GDR-system is adjusted to the former FRG-system whereas in Russia the education system has to reform from within. This causes different conditions for realising the new checks and balances needed. Given the similar tradition in both education systems (at least the last few decades) it might be interesting to study the outcomes of these educational reform processes for the time being. It is expected that the dynamics of these processes turn out to be similar to a certain extent but also differ. As far as the influence of inspectorates on the implemented curriculum is concerned it is expected that the objects and 'methods' of control and advice differ.

In order to find out whether these expectations are correct the model presented will be used and elaborated by concentrating the analysis of information on the following topics:

- organisation of inspectorates;
- their formal relations and competencies in the education system;
- the character of the relation between inspectorates and schools (hierarchical, supportive, administrative, intermediary, other);
- 'methods' used by inspectorates to influence the implemented curriculum;
- objects of influencing the implemented curriculum;
- regulations regarding the content and implementation of the curriculum; and
- provisions for realising the curriculum like teachers, teaching materials and other resources.

J. Braaksma
University of Twente
P.O. Box 217
7500 AE Enschede
The Netherlands
Phone: +31 - 53 - 892081

Curriculum Development in a Post-Socialist Society: an Example of Estonia

Urve Läänemets
Tallinn Pedagogical University, Estonia

The recent collapse of the socialist system in Eastern Europe has had its inevitable effects on education. Former Soviet republics actually gained more freedom for deciding their educational problems since perestroika started. With declaration of regained independence the Estonian state also overtook full responsibility for educational innovation and its management. Education in a post-socialist society, which has chosen the way of democratic developments, has to take decisions about:

- the content of available education offered on its various levels from pre-school to university and
- the organization of educational institutions and learning processes in them.

It is evident that the first of the mentioned has priority whereas the second is to be derived from the decisions taken about what level of education is going to be offered.

Presently, 9 year compulsory education is guaranteed by the state to all its citizens whereas the following levels of education are in the stage of taking shape. Considering the content of education the most essential changes in all the post-socialist societies have been:

- in the field of social sciences (civics, history, etc.) offering new and more free value orientations;
- in the field of language subjects, especially in learning foreign languages, which have regained their former position, offering knowledge and skills badly needed under new circumstances as means for international communication;
- in the field of optional subjects which give students an opportunity to design their own education to a certain extent.

The new responsibility is the compilation of national curricula for different school types on various educational levels and the establishment of national standards. The new educational philosophy and basic structures of curriculum design are still in the stage of development, but considering the change from unified content and strictly prescribed syllabi to the opportunity of free implementation of desired national standards in education, the following levels of curriculum design seem to be most appropriate:

- state level curriculum as a document of social agreement ascertaining the main goals of education and national standard concerning the content of certain school subjects,
- school level curriculum as a document for organizing the process of learning, which is compiled by teachers with the aspiration to achieve the national standards, fixed in the state level curriculum documents.

The form of presentation of educational content has changed from in details prescribed syllabi to more open frameworks, which last longer and give teachers new opportunities to find more adequate study materials and organizational forms to meet their students' needs and interests and their own pedagogical style.

However, one should be most careful with too rash decentralization, as the teachers and school leaders need some time to acquire skills for taking local responsibilities.

Special research has been carried out and implemented in Estonia for development of foreign language syllabi (frameworks) to meet new demands on broader competence of using different languages in our geopolitical region. Political changes in society usually have the greatest and most rapid effects on the content and organization of language learning. As expected, English has achieved the position of the first foreign language and Russian has fallen into a momentary disgrace. One should, however, avoid short-sighted and usually politically teinted rash decisions, which could have undesired effects for future.

Considering educational traditions in Estonia, the following strategies could be most implementable:

- maintenance of achievement-oriented learning and teaching
- development of "thinking curriculum" for all educational levels
- maintenance of balance between stability and flexibility in educational innovation.

Education for new and independent Estonia should be a means of international cooperation and preserving national identity.

Urve Läänemets
Tallin Pedagogical University
25 Narva Road
EE0001 Tallin
Estonia
Phone: +7 - 372 - 2 - 447956
Fax: +7 - 372 - 2 - 425339

Elements of Hidden Curriculum in Estonian Education under Soviet Regime.

Inge Unt
Tallinn Pedagogical University, Estonia

According to some neomarxist theories, hidden curriculum reveals itself in capitalist countries: in spite of seemingly nonpolitical character of the school, it moulds bourgeois ideology and reproduces class structure. A question arises: Is it possible to find similar effects of hidden curriculum in former socialist countries, i.e. is it possible to trace effects contradicting officially formulated political aims of curriculum? Our paper is dedicated to the analysis of this problem in Estonian school.

The development of national curriculum in Estonia could be divided into three periods:

- the period of independent republic (191801940) during which a curriculum was compiled to meet the needs and aspirations of a new state. This period is characterized by substantial influence of the European and American reform pedagogy;
- the period of Soviet occupation (1940-1991) during which the schools and teachers all over the Soviet Union had to follow the unified and centralized curriculum;
- the period of reestablished independent state, which is characterized by thorough recompilation and innovation, which is still going on at the moment.

This paper is dedicated to the problems of hidden curriculum in Estonian school during the Soviet occupation, i.e. during a period of the totalitarian regime.

According to our hypothesis, several phenomena of hidden curriculum were influential during the mentioned period.

We started our research, as several contraeffects to most carefully planned unified education occurred in spite of the curriculum, which followed goals of communist ideals and exercised strict control over teachers' activities and published school textbooks. The effect of education was very often just the opposite to the desired by the powers. This phenomenon could be observed during the whole period of occupation.

Such contraeffects became evident in the first opportunity. Immediately after perestroika started, stormy antisoviet movements followed (mass meetings, the Baltic chain, independence referendum etc.) during which the whole nation demonstrated their unanimous decisions in political problems as well as generally shared democratic attitudes and values. Of course, the several influencing factors played a part here. We suppose one of these factors was the effect caused by hidden curriculum, which belonged as one component to the Estonian culture of resistance and acted as balancing phenomenon against ideological pressure of the Soviet regime.

Empirical data for this research were collected by questionnaire (answered by about hundred teachers, mainly of humanities subjects).

The most essential conclusions are the following. The effects of hidden curriculum were obvious in the domains of values, attitudes and knowledge. The hidden curriculum had its influence on various levels of education and several connections could be traced between the unconscious and intentional activities of teachers. In the school the following main factors of hidden curriculum were influential.

- The effect of curriculum was contrary to the planned in cases of evidently wrong information or of primitive educational pressure to students.
- The teacher changed unsuitable material for learning (omission of problems, abbreviations, changed accentuation) or presented the compulsory content with evident formality.
- Schools and the teachers added to the curriculum supplementary material essential for the development of national identity (broader treatment of Estonian history and culture, conformable nomenclature of optional and free subjects, home reading and the like).
- Use of allowed fields of extracurricular activities (protecting nature, country study, language studies, song and dance festivals etc.) to secure ulterior objects; deprivation of compulsory political meetings of their political content, emotional celebration of allowed national fetes, keeping alive old traditions of schools.
- Teachers conveyed their real attitudes with nonverbal means (facial expressions, gestures), presented their own ideas emotionally and ideologically compulsory material in a sec in different tone, mixed with irony.
- The effect of those teachers who exactly followed the requirements of the Soviet regime were annulled by activities of differently minded teachers.
- Students' mutual influences where usually antisoviet attitudes were dominating; sharing with fellow students of information, received at homes, especially of facts, concerning true history of Estonia.
- When students acted contrary to a prohibition (decorating clothing with national symbols, making parodies of the interpretation of Soviet songs), the teachers ignored it.
- Awareness of the existence of distinctive features of Estonian school within the Soviet Union (availability of a number of textbooks, compiled in Estonia, differently designed school interiors, our own schools uniforms).

The character of effects of hidden curriculum depended on the period of occupation: the opportunities presenting themselves were different under the Stalin terror regime, during the Khruschov "thaw" and during the period of extremely intense russification in seventies and eighties.

This list of factors of hidden curriculum is of course incomplete. Our paper is the first attempt to study this phenomenon in the recent history of Estonian school and undoubtedly further research is needed.

It would be also interesting to study the phenomenon of hidden curriculum in other former Soviet republics and socialist states. Probably several other similar and different factors could be discovered, created by historical, national and other regional conditions.

I. Unt
Tallin Pedagogical University
25 Narva Road
EE0001 Tallin
Estonia
Phone: +7 - 372 - 2 - 447956
Fax: +7 - 372 - 2 - 425339

Where is the Teacher's Competence?

Majda Psunder
University of Maribor, Slovenia

The theoretical part of the essay draws on the established verities regarding teacher's roles (as a human being, expert, civil servant). All three levels are present; however, one of them is practically always emphasized. The relation between the teacher and the participants in the education process is based on their different roles: in the educational process the two roles are not identical but of equal value. In terms of equality of both partners in the educational process we speak of the democratic, anarchic and autocratic relations. Also important is the interpersonal relation which dynamically influences the behaviour. The behaviour of the participants in the educational process depends on the directness and indirectness of their relation, which can mean a one-way communication or a more humane dialogue. A humane dialogue is possible if the teacher uses and controls his general and pedagogical competence. On the contrary, the hierarchic competence is supported by legal authority. The teacher is invested with legal authority when he becomes a teacher, but acquires actual authority thanks to his knowledge, an interpersonal relation with his pupils, his vested effort and use of rational and humane educational procedures. The teacher acquires actual authority, but may also lose it, if he ignores the situation requirements present in the educational process, such as the fact that pupils need time to get used to the educational activities, the initial and final enthusiasm of the teacher and other participants in the educational process, and such factors as boredom and monotony.

The empirical part will present the study topic and the hypotheses, study sample and results. Hypotheses were made that the expectations of the participants in the educational process towards their teachers differ according to the level of education of the surveyed participants, that the participants expect to see the teacher above all in the roles of an expert and a human being, that they reject the teacher's imposition of legal authority, an autocratic relationship and hierarchical competence, and that the problems arising from situation factors are in the majority of cases caused by the teachers. All the hypotheses were tested on a sample of 2000 participants in the educational process, namely, 500 pupils of lower grades in elementary schools, 500 pupils of higher grades in elementary schools, 500 high-school students and 500 university students.

M. Psunder
University of Maribor
Faculty of Education
Koroska 160
62000 Maribor
Slovenia

Phone: +386 - 62225611
Fax: +386 - 6228180

Teacher Development for Computer Education in Germany: Results from the IEA-Study

Manfred Lang
University of Kiel, Germany

Gaps in the Development of Computer Use

Since 1971 the ministries of education and federal conference of all German states (BLK) made great efforts to introduce computers into schools. In a first stage during the 70s about 100 pilot projects in different schools were supported. In a second stage during the 80s the experiences from these and some additional pilot projects were used to develop a conceptual frame for Information Technological Education for lower and upper secondary level. In addition frames for new syllabi and a system for teacher education were introduced.

During the past years in the 90s one can recognize a third stage of consolidation. Syllabi are revised and computer use is expanding from special courses and few preferred subjects into all different subjects. But without having solved all the old problems, in addition new tasks have to be solved: New trends are coming up to use communication technologies and multimedia; political discussions are initiated about using computers in primary schools; since unification west and east German states gradually have to develop equal standards.

In this very complex and rapidly changing area teacher education and support is a crucial task. Teachers are generally very interested to use computers in school. But unfortunately there are still schools and teachers with no experience about computer use in education or computer using teachers have serious problems with hardware, software or lesson planning.

The System of Teacher Education

The German system of teacher education for information technology is mainly based on inservice training by state institutes or in the schools. Additional support by the ministries is given through recommendations, software documentations, supervision and consultations. Preservice training in universities in this area is until present restricted to computer science mainly in upper secondary level. Unfortunately there is another barrier for effective use of preservice training in schools: financial cutbaeks restricted the employment of young teachers in the past.

The federal states in Germany put great effort in their plan to reach each school for teacher-training in a preferably short period. For this purpose a procedure with different levels was developed: On the central level special persons for diffusion were trained. They were responsible for training teachers on the regional level. These trained teachers then offered in-service training in their schools.

The offers for teacher training are different in the different states. On the central level some states introduce teachers into objectives and basic concepts of information technological education. Other states emphasize the special role of information technology in different subjects or topics of special interest. On the regional and local level training is offered mainly for practical use of hard- and software, to a minor degree in same states for lesson-planning or didactic construction. In some states a model of representatives for different subject is practiced, i.e. at the regional or school level teachers took the initiative for training in different subjects. Usually they are trained for several days or some weeks depending on the different states in Germany.

The ultimate goal of information technological education to use computers in each school for topics of almost all subjects is very ambitious and may be reached sometime in the future. In 1992 only 80% of all lower secondary level schools in western Germany used computers and in these schools only 26 % of all teachers use computers in their lessons. This is the outcome of a survey, conducted by the IEA (International Association for the Evaluation of Educational Achievement) on computers in education in 1989 and 1992 (Hansen & Lang, 1993; Pelgrum et al., 1988, 1993).

Results from the IEA-Study about Teacher Development

Teacher training courses are mostly introductory with presentation of theory and techniques and some practice to get acquainted with programming, hard- and software or general applications like word-processing. Teachers participating in different courses prefer to attend courses of the same level (introductory or advanced) but with different types of content. Mostly they combine courses about hard- and software (type 1) and general applications (type 2). Courses for programming, didactic or technical help (type 3) are hardly combined with courses of type 1 or 2. The time for a course is mostly only one day.

90% of the teachers indicate, that they learned something about computer use: 59% through self-studies, 12% through teacher training in the school, 18% through inservice teacher training by state institutes and only 5% through university studies. The frequency of self-studies plays the most important role compared with other kinds of training for computer use. This is also true for the time-exposure with 10 hours per week on the average. Teachers estimate the average time-exposure for training-courses in the past 3 years only with 20 hours. The majority of teachers does not attend teacher training courses because they consider them not to be suitable for their subjects in most cases.

Mainly teachers with computer science, mathematics and science appreciate a sufficient offer about programming and problem analysis in training courses. Teachers teaching German lessons prefer topics about word processing, which are offered relatively often. The offer of these topics even increased during the period between 1989 and 1992. Problems of hard- and software, data base, spread-sheet calculations, general and technical applications and educational aspects are named less frequently in teacher training. But all topics offered in teacher training are not sufficient for the broad variety of different applications in different subjects. The question, whether the topics in teacher inservice training have contributed something to the application in the different subjects, is answered positive or negative according to subject: 53% of the teachers with the subjects mathematics or physics benefit from the topics about application in their subject. But in contrast to this only 26% of the teachers with foreign-languages, 28% with chemistry, 29% with biology or 31% with German profit from the offered applications in inservice training.

The use of computers for communication within networks is still underdeveloped in Germany. Only 6% of teachers have access to networks, compared with 23% in the USA or 37% in The Netherlands. In 1993 the institutes of the different states, responsible for teacher training, started with pilot studies to develop regional subnets and a national and European school net.

To summarize it can be said that the readiness of computer use in lessons is relatively high. The offers in teacher training are limited concerning the needs of teachers for different subjects. Therefore a part of the teachers get their help through self-studies. The integration of information and communication technologies into the subjects is another field demanding intensive efforts in teacher training.

M. Lang
University of Kiel
IPN
Olshausenstr. 62
24098 Kiel
Germany
Phone: +49 - 431 - 8803162
Fax: +49 - 431 - 8801521

Developing Investigative Learning in Science: the Role of Collaboration

Patricia Murphy, Eileen Scanlon, Barbara Hodgson & Liz Whitelegg
Open University, England

Introduction

The central aim of the Collaborative Learning and Primary Science (CLAPS) project is to explore the cognitive benefits children gain from learning in groups particularly in the context of recent curriculum moves towards investigative learning in science. The research examines the processes which operate in groups tackling investigative science tasks and the way in which these processes can support children's science learning.

Background

The significance of peer interaction in learning has emerged from the social constructivist perspective on learning and development. Thus whilst it is accepted that it is the child who constructs mental models of how the world behaves, these higher order cognitive processes are considered to be formed in structures transmitted to the child by others through speech, social interaction and co-operative activity (Vygotsky, (1978). Reviews of studies of peer interaction do indicate that individual learning is enhanced by peer interaction but only when participants have some understanding of the task and share the decision making (Joiner, 1993).

The focus on investigative learning in science reflects the view of knowledge as a tool, i.e. where concepts are progressively developed through action (Brown, Collins & Duguid, 1989), To develop knowledge that can be applied across contexts an investigative approach involving children in defining problems, developing strategies, collecting and interpreting data and evaluating actions is essential. The significance of this for research is twofold. If collaborative and investigative activity are essential elements of science learning then children's collaboration should be explored in this context. Furthermore, if investigative activity depends on both procedural and conceptual understanding, research must pay attention to children's procedural competency, how this is mediated during collaborative activities, and the effect of this on science learning (Murphy, 1989).

Primary teachers have in recent years given priority to children's process understanding in science. However it remains unclear whether they are aware of the interdependence of children's procedural and conceptual development and the consequences of this for teaching. Most primary teachers continue to place a high value on group work. For many, though, groupwork is the means to achieve social and affective development rather than cognitive. It is again questionable whether teachers are aware of the cognitive benefits derived from collaboration or of the way children's affective characteristics mediate their cognitive responses.

Methodology and data collection

Preliminary studies have been conducted in two primary schools and an extended pilot case study has been completed. This followed two groups of children age 9 - 10 years doing science activities over a period of five weeks. The topic was water and four different activities were filmed in which both groups were involved. We also filmed the target children working in different group settings.

To examine the factors identified as significant, we also interviewed teachers about: their approach to science generally, and to specific tasks; their views of what would be achieved and of what was achieved and for what reasons; and their reasons for grouping children and their views of the successes and failures of particular situations. We interviewed the target children about their intentions and actions and probed, where appropriate, their procedural decisions, conceptual understanding and feelings and attitudes to groupwork and their view of its effects on their learning. A questionnaire on attitudes to groupwork and group compositions was also given to all children in the class.

Emerging issues

Conflicts of tasks

A usual requirement imposed on pupils in groupwork is to develop a shared task. To achieve this we have observed children attempting to compromise quite different interests and perceptions of what constitutes the task. In one instance a group of boys generated two alternative hypotheses to explain why a toy car might travel further down a slope. To achieve the teacher's goal of a shared task the group combined the two hypotheses and confounded two independent variables, the height of the slope and the length of the slope. Consequently whilst the boys collaborated effectively and were procedurally competent, they were unable to interpret their data. The teacher's goal quite unintentionally thwarted the learning objectives.

In another situation in a mixed group a girl and boy disagreed about the task. The teacher had provided the group with an everyday problem scenario about the time taken for sugar to dissolve in a cup of tea. The scenario referred to time and stirring only but was followed by a task which asked children to investigate the effect of temperature on the time to dissolve sugar. The disagreement arose because of the different weight the girl and boy gave to the everyday context. The girl took the everyday situation as the problem and wanted to replicate the scenario. In the end a compromise was reached where the temperature of the water was judged by the time left after boiling, no actual temperature was taken - the girl's view of what was required. However three readings were taken at 0 minutes, 5 minutes and 10 minutes, which took account of the boy's attempt to investigate temperature as a continuous variable. Both children remained committed to their perception of the task and found the compromise unsatisfactory. That girls and boys typically differ in what they consider to be relevant and noteworthy, given the same circumstances, has been established in research (Murphy, 1991). The effects of group differences need to be understood by teachers and children alike if effective collaboration is to be facilitated in classrooms.

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Selecting groups

Teachers typically group children who appear to hold common views. This practice is seen to promote the 'shared' task approach. In one activity a group of children were exploring the effect of temperature on the rate of evaporation. They agreed that the higher the temperature the quicker the rate of evaporation. However they differed in their views about the effects of humidity. One boy felt that low humidity would enable more water to evaporate, one girl considered that the opposite was the case. Whilst this appeared not to affect their ability to pursue a common task, it radically affected how they interpreted their results. The teacher's aim in this investigation was to develop children's understanding of evaporation. He was, however, unaware of the influence of these different but related views on the children's developing understanding of the process.

Selecting tasks

The teacher we observed was very thoughtful in his attempt to manipulate task demands to achieve progress. One group was comparing the effectiveness of different media for filtering pond water. This task was selected by the teacher to develop children's understanding of fair testing. Whilst the children agreed about some of the control variables such as the amount of pond water, they differed in their views about other variables such as the number and size of the holes through which the filtered water was to pass. These variables were controlled for by the group but some children could not understand why. This understanding depends on children's conceptual knowledge. To progress beyond the general notion of fair testing to an understanding of which variables to control and when requires teachers to consider children's differing conceptual notions even in tasks designed to meet procedural objectives.

Another consequence of this was noted when the boys' group were exploring the cars on slopes. The teacher had selected the task to develop children's ideas about gravity. Consequently he tended to probe the children's thinking along these lines. In their investigation the boys' ideas of fair testing was quite limited and essentially what they thought they controlled was the starting point of the cars. This became labelled as part of the fair test approach yet ensuring the same zero point is an aspect of the measurement strategy which needs to be distinguished from the control of variables. The teacher's focus meant that this was not picked up but the pupils had potentially learnt something that might hinder their future progress.

Conclusion

The interdependence of children's conceptual and procedural development further complicates teachers' attempts to establish effective and manageable collaborative learning situations.

To explore collaborative learning in domains such as science a classroom context is essential. In this context attention can be paid to teacher's and children's intentions in order to make sense of the tasks used and perceived. It is also necessary to look at the way group composition influences group behaviour and how differences in children's conceptual and procedural understanding and affective characteristics after the tasks they perceive and the sense they make of them. These insights are crucial if effective teaching strategies are to be developed.

P. Murphy
School of Education
Open University
Milton Keynes, MK7 6AA
United Kingdom
Phone: +44 - 908 - 652376
Fax: +44 - 908 - 653744

Profiles of Productive Schools: Comparative Research About Lasting Curriculum Renewal in Primary Schools

Uwe Hameyer
University of Kiel, Germany

Jan van den Akker
University of Twente, the Netherlands

This contribution draws upon a comparative research study about sustained improvement in primary schools. Emphasis is given to the level of 9 to 10 year old children. The findings will be published in a book (Hameyer, van den Akker, Anderson, & Ekholm) in spring 1995.

The authors will give insight into some case study documents about the inquiry curriculum as implemented in 15 schools in Germany, the Netherlands, Sweden, and the US. This cross-country comparison is called IMPACT - *Implementing Activity-Based Learning in Elementary Science Teaching*. The main purpose of IMPACT is to explore lasting changes in schools which are considered productive as to specific selection criteria which will be explained in more detail. The focus is laid on processes by which activity-based curriculum components and principles are anchored both in classroom teaching and in life of the particular school.

IMPACT mainly used multi-site case study methods. The comparison is based upon classroom observation, repeated interviews of students, principals, teachers and other staff, analysis of instructional materials, photographic documentation of the learning environment, and other.

The authors describe exemplary practices which emphasize activity-based learning and the particular inquiry curriculum in place. Empirical information is added about the degree to which students organize their learning activities on an increasingly autonomous level. Another research question refers to how headmasters encourage the processes of instructional improvement and curriculum renewal. The authors also show the extent to which the environment such as parents, authorities, or educational policy-makers stimulate or impede the process until the new has been institutionalized.

Based on exemplary IMPACT findings, the authors will identify characteristics of primary schools which succeeded in sustaining instructional and organizational improvement over more than 1 or 2 years. The contribution goes beyond classical implementation in so far as conditions for *long-term* improvement on the school level will be identified and explained.

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The processes from "debut" through final institutionalization will be in the centre of this contribution.

U. Hameyer
University of Kiel
Inst. of Education
Olshausenstraße 75
24118 Kiel
Germany
Phone: +49 - 431 - 8801567
Fax: +49 - 431 - 8801567

J. van den Akker
University of Twente
Department of Educational Science and Technology
P.O.Box 217
7500 AE Enschede
The Netherlands
Phone: +31 - 53 - 893551
Fax: +31 - 53 - 329136

Science and Mathematics Teacher Professional Development for Long-Term Curriculum Improvement in Southern Africa

Chair: Coen Stoll
Free University of Amsterdam, the Netherlands

The Context for Improving Science Education in Southern Africa: Problems and Strategies

Leo de Feiter
Free University of Amsterdam, the Netherlands

Introduction

Curricula in most developing countries originated from the industrialised world and usually were modelled on the educational system of the original colonial power. Nowadays in most countries indigenous curricula and materials exist, especially at primary and junior secondary levels. At senior secondary level the direct influence of the developed world is often still strongly felt. This especially holds for science and mathematics, and for countries with small educational systems. In this symposium the example of four countries in Southern Africa will be concentrated on: Botswana, Lesotho, Namibia and Swaziland. Although widely different in size, all four have comparable population sizes of approximately 1-2 million and comparable educational systems which are modelled on the British one. Botswana, Lesotho and Swaziland became independent halfway the 1960s having been British Protectorates before that. Namibia recently became independent in 1990 after having been dominated by South Africa since the first World War. Namibia decided after independence to model its educational system more closely after the British one. The final examination (and the associated curriculum) in all four countries is an international version of the British examinations from the Cambridge Examination Board. Little locally developed material is available to support the curriculum at senior secondary level. At junior secondary level the situation is a bit better, but far from adequate. Locally developed material is often a superficially adapted version of (sometimes obsolete) British or South-African examples.

The absence of appropriate materials to support curriculum practice adds on to the staggering number of problems that already exist in schools in developing countries due to the rapid growth in enrolments and the lack of financial and human resources to cope with growing demands. Quantitative expansion of the provision of education has in many countries led to eroding quality. Apart from being not appropriate, materials often simply are not available or teachers are untrained in their use.

This paper outlines some of the main factors that are essential in reaching sustainable curriculum improvement:

- development of a local experienced teaching force;
- controlling expansion and improving school organisation;
- indigenous curriculum and materials development with involvement of local teachers.

Finally, different types of interventions through inservice education of teachers are indicated. and a programme of formative evaluation research of interventions will be outlined. Such a programme has been embarked on as a cooperative venture between teacher educators in countries concerned and staff from the Vrije Universiteit Amsterdam and the University of Twente in the Netherlands.

Development of the teaching force

A critical factor for the long-term improvement of the science curriculum is the presence of a sizeable and experienced local science teaching force. In many developing countries this often is a serious problem. Many science teachers are un(der)qualified or expatriate and the limited number of qualified local teachers often opt to leave the profession for greener pastures. Also in Southern Africa this is still a major problem due to various factors. Governments and Universities in the countries concerned have for a long time recognised this problem and have taken various steps to address it. One of these steps is the establishment of special projects, often set up with assistance from donor organisations. The experiences reported on in this symposium originate from such projects in the four countries and are executed in a cooperation between local Universities and Governments and the Vrije Universiteit Amsterdam, and are funded by the European Community and the Dutch Government.

One of the main problems for science education is related to the inadequate output of secondary science education as regards numbers and quality of students, the resulting inadequate intake in tertiary education (especially teacher training courses) and consequently the weak professional group of teachers in science subjects (a 'vicious cycle'). Two main types of project strategy have been maintained, i.e. 'bridging courses' between secondary and tertiary education (Cantrell e.a. 1993; Dulfer & Thijs, 1993; Kool & Stoll 1993) and in-service training of practising teachers (De Feiter, 1993). During the eighties the emphasis moved gradually from the first to the second strategy.

In the course of the eighties the numbers of qualified local science teachers gradually increased, although the simultaneous growth in the size of the teaching force often made that percentage-wise this improvement is less significant.

An inadequate supply of qualified science teachers is often far from the only cause of an insufficiently localised teaching force. Non-absorption in the teaching force of trained teachers and attrition of teachers are other main causes for the unsatisfactory degree of localisation and the relative lack of experienced teachers. Improving the retention of local teachers can therefore be seen as a first priority in aiming at the improvement of secondary science education. Professionalisation of the teaching force, for example through participation in inservice teacher development activities, is an important way to try and accomplish this.

Growth of enrolments, expansion of facilities, leadership and support

Over the last few decades the growth in the secondary school system has been tremendous. Marked differences exist in the pattern in which this expansion has been accomplished. In some cases a large increase in the number of secondary schools can be seen, in other cases the growth is accomplished through an increase in the size of schools.

The consequences of a fast increase in the number of schools for the quality of education can be quite severe. Newly established schools are often relatively disorganised, they lack facilities and a stable teaching force, and often the learning results in such schools leave much to be desired during the first years. Furthermore, a small size of schools prevents an efficient curriculum organisation. Streaming in schools (at senior secondary level) according to ability and interest becomes very costly. Especially also for science subjects, where already the teaching force is relatively inexperienced or expatriate, the increase in the number of schools spreads the available amount of expertise and leadership in the country too thinly. Improvement strategies should therefore pay extensive attention to the establishment of local and regional support structures and the development of leadership in schools.

Improving curriculum practice

The fact that the intended curriculum at senior secondary level is dominated by a foreign examination of British origin has been mentioned above. This continuing dependence means that the intended curriculum is regularly adjusted in line with developments in the British educational system. For example, curriculum development in the sciences was in the '60s and '70s strongly influenced by the Nuffield foundation and emphasis was put on learning and teaching 'the scientific method' and the use of practicals in teaching. During the 80s more and more emphasis was placed on 'science and society issues' and science education shifted towards 'science for all' (as opposed to 'science for future scientist') (Ware, 1992). These shifting aims of science curricula can only be recognised in the overseas British examinations. Furthermore, textbooks and other curriculum materials reflect these changes. Such materials are often the only ones available on the educational market in countries concerned, albeit often in outdated versions.

In view of the various factors indicated above, it is not surprising that the curriculum as implemented in schools and classrooms is often rather far removed from the intentions of official curricula and examinations. Teachers have a limited background and experience, have to cope with a lack of appropriate facilities and materials, and teach in schools that are often not well organised and lack an appropriate support structure. Furthermore, their students are often not up to or interested in the syllabus they are supposed to teach due to its general inappropriateness or the lack of choice the school is able to offer. Much teaching in schools is of the 'chalk and talk variety' and emphasises rote learning.

A number of forces shape the continuing dependence of science curricula and associated materials on the industrialised world. Although valid arguments do exist for a small educational system in the developing world to stay part of an internationally recognised examination system, many educational and economic reasons are felt to have indigenous materials supporting curriculum practice.

Developing such materials for the entire science curriculum and shaping the intended curriculum in accordance with the specific circumstances of a society can only viably be reached as a long term aim. Discussions on this have to be fed by experiences coming from an indigenous and sound curriculum practice, and should intensively involve experienced local teachers. In curriculum development the order of events has usually been the other way around: curriculum development informs curriculum practice. For developing countries in situations as sketched above the long-term strategy may even be more appropriately chosen as a reversal of the usual sequence: a (re)vital(ised) curriculum practice is a prerequisite for curriculum reform (Ware, 1992). Van den Akker and Plomp (1993) convincingly argue for a closer integration of curriculum development and research into classroom curriculum implementation in their concept of development research. Especially for developing countries this is a promising approach (Van den Akker, Ottevanger & Plomp, 1994).

In developing countries professional development of teachers is a starting point for curriculum improvement. Local 'ownership of the curriculum' requires a relatively stable professional group of teachers that develops an indigenous view of the science curriculum.

Effectiveness of strategies

In the various inservice programmes in Southern Africa reported on here, different groups of teachers are targeted and different strategies are employed in efforts to strengthen the teaching force and improve curriculum practice in schools. These strategies include:

- support programmes to beginning teachers
- school based support and development of curriculum practice
- development of curriculum materials and inservice training in the use of materials
- development of local and regional networks and support structure
- training of local, regional or national leadership
- support to professional organisations in e.g. publishing newsletters or organising science fairs

Staff from the various projects and departments in the four countries, in collaboration with staff from the Vrije Universiteit Amsterdam and the University of Twente have recently embarked on a programme of formative evaluation research of various strategies that are being employed. In this symposium first experiences from this collaborative programme will be reported on.

In general terms the **research problem** is formulated as:

> *How can the effectiveness of interventions that are meant to support and promote the professional development of science and mathematics teachers be enhanced?*

The primary aim is to gather information that can improve the existing inservice activities and the proposed research is developmental in nature.

The general problem is subdivided into sub-problems for different stages of the professional development of teachers and for different types of interventions. Furthermore, additional problems are formulated regarding the context in which teacher training takes place. All together 6 main areas of research are included. These main areas are:

- What is the composition of the teaching force and which trends can be identified during the past years?
- What is (the variation in) the structure of the professional environment (curriculum and materials, pupils, schools, results) and which trends can be identified during the past years?
- Which patterns and trends exist in the demand, supply, absorption, retention and attrition of locally trained and qualified science and mathematics teachers, especially at senior secondary level, and which motives shape individual career decisions of these teachers?
- How can inservice activities promote the professional development of beginning teachers? How is this professional development influenced by the background of the teacher on the one hand, and by the working environment on the other hand?
- How can inservice strategies and materials best influence the broadening and deepening of the professional repertoire of teachers? To what extent do differences in the professional environment and between different individuals have to be taken into account?
- How can inservice strategies influence the development of leadership in the professional group of science and maths teachers? Which factors facilitate, and which interfere with the development of leadership?

About 20 researchers from the various countries met in Swaziland in April 1994 to develop detailed research proposals. The programme is planned initially for approximately one year, after which reporting and evaluation will take place.

L.P. de Feiter
Free University of Amsterdam
Centre for Dev. Coop. Services
De Boelelaan 1115
1081 HV Amsterdam
The Netherlands
Phone: +31 - 20 - 5485025
Fax: +31 - 20 - 6462320

LESPEC-PESP: A Changing Bridging Course between Highschool and the National University of Lesotho

Mieke Kapteijn & Lisette van Rens
Free University of Amsterdam, the Netherlands

Mamotena Mpeta
National University of Lesotho, Lesotho

In order to increase the number of students that are able to enter a science based study after highschool a bridging course was established between school and tertiairy education in Lesotho in 1981, the LEsotho Science Pre-Entry Course (LESPEC). The course prepared a selected group of high school leavers to embark on a science tertiary programme of study at the Science Faculty of the National University of Lesotho or at Lerotholi Polytechnic. The main aims of the Lespec course were to upgrade the subject knowledge and skills in science and mathematics and to improve the study skills. This happened during a sixth month study programme, in which mathematics, chemistry, physics, biology and English and study skills were taught.

Because LESPEC was meant to be a temporary project, LESPEC was phased out in 1993/1994. Although the results from high schools in Lesotho improved over the last 12 years, both the University and the Polytechnic still recognised the need for a more permanent type of booster course to replace LESPEC for all students entering the Science Faculty and the Polytechnic. In 1994 both the National University of Lesotho as well as the Lerotholi Polytechnic 1994 started new bridging programs. The Pre-Entry Science Programme (PESP) at the University and the Technician Induction Programme (TIP) at the Polytechnic.

From May- July 1994 the first PESP course took place at the University. This course differs from the LESPEC course in several aspects:

- the way students are selected for University differs from the way LESPEC selected students;
- the length of the course is only three month;
- the content of the course is changing because of a more direct communication between University staff and PESP staff;
- the course takes place at the campus of the University, students are less 'cared for' than in the LESPEC course.

LESPEC was a successful course. Students from LESPEC did better in the first years of University than the students that entered directly. It is important that is becomes clear which aspects of LESPEC should be kept and intensified.

Little is known about the background of the highschool leavers. Little research is done into the factors that made LESPEC successful.

In the first PESP course data were collected on the background of students, their performance at high school and the change that took place as a result of different selection procedures. Data were also collected on some of their study skills and the change of these skills during the programme. These data and the role they can play in improving the PESP programme will be discussed in the symposium.

M. Kapteijn
Free University of Amsterdam
IDO/VU
De Boelelaan 1115
1081 HV Amsterdam
The Netherlands
Phone: +31 - 20 - 5485050
Fax: +31 - 20 - 6423155

Biology In-service Training in Swaziland: an Evaluation of the Approach of IMSTIP

Sebo Boerma
University of Twente, the Netherlands

Introduction

In Swaziland, a small kingdom in Southern Africa, an in-service programme for science and mathematics teachers is running, which has its roots back in 1978. It is an interuniversity cooperation programme between the University of Swaziland and the Vrije Universiteit Amsterdam. Aim of this programme is to improve the science and mathematics teaching at High Schools in Swaziland. By organizing workshops and designing teaching guides amongst other activities, one tries to teach the teachers to use a more practical and pupil centred way of teaching.

In 1992 the project IMSTIP (In-service Mathematics and Science Teaching Improvement Programme) ended and was continued under the name SMART (Science and Mathematics Advice and Regional Training project). In order to establish the baseline for this new project an evaluation was held of the approach of the previous project. Because this approach was still used in 1993 and 1994, the evaluation was focused on these two years. The evaluation was held within the biology department. The aim of the research was:

To describe the starting point of SMART based on evaluation of the in-service approach of IMSTIP of the last two years as regards the effectiveness and quality of the in-service approach for biology.

Design of the study

In order to describe the starting point a model of Goodlad et al. (1979), amplified by van den Akker (1993) was used as a framework. This model makes a distinction between six curriculum representations. This way not only attention is paid to the ideas of the designers and the way the curriculum is experienced by the participants of the workshops, but also for instance to the way the workshop is put into practice. This way one gets an overview of the whole process.

Next to that a framework from Klein (1991) was used. She splits the curriculum into 9 curriculum decisions that have to be made. These decisions range from decisions about the goals of the workshop to decisions about the way the students are grouped during the workshop.

Both the workshops and the teaching guide are seen as a curriculum in this research, although the focus of the evaluation was different. For the workshops the focus was on the SMART project: How effective is the in-service approach of the biology workshops, particularly in regard to the way participants of those workshops implement the teaching methodology as promoted by the project? For the teaching guide the focus was more on the school practice: How effective is the teaching guide "Organisms and their Environment" in supporting the implementation of the teaching methodology as promoted by the project? A third item of this evaluation was the environment, its attitude towards in-service training and its role in this approach. The results of the research on the environment were used as background information.

For answering the questions a variety of methods was used in order to gather more reliable information, in other words triangulation. Questionnaires were sent to biology teachers, headteachers, and pupils, interviews were held with biology teachers, the senior inspector of science, and staff members of SMART, and lessons given with help of the teaching guide were observed. Also staying with the project during the evaluation gave a better insight in the project. Next to this document analyses of both the teaching guide and the written materials of the workshop were performed.

Findings and conclusion

As a result of this research an as broad as possible picture of the baseline of SMART would be offered. Moreover, some major conclusions can be made.

First of all, the three elements of this research (the workshops, the teaching guide, and the environment) do not form a coherent entirety. Although most of the persons involved in this evaluation stated that they support the attendance of workshops and the purchase of teaching guides, this support most of time only manifests itself in informing the teachers about workshops and teaching guides. In schools, no supportive environment is created in the sense that teachers are given extra time for preparation of lessons or study. No follow up of the training in whatever form is given by the project. The workshops itself more focus on the evaluation of the content of the teaching guide, than on training teachers in using that guide. Apart from a bit of theory none of the components mentioned by Joyce & Showers (1988) as being effective were present in the in-service training approach.

This leads to the second major conclusion. The workshops, as well as the teaching guide, are more or less providing the teachers with tools for making their lessons more practical. However, hardly any attention is paid to the way teachers should use these tools. During the workshops teachers more or less play the role of their pupils when practising learning activities for making the lessons more practical. The teaching guide also just describes the activities and does not pay any attention to the way to organize the lessons and to the benefits of this change in teaching style.

Then there is the problem of the gap between the daily practice of the teachers and the characteristics of the innovation. From observations it became obvious that teachers were not used to a more practical and pupil centred way of teaching. They normally use the expository way of teaching, so it is clear that a more practical and pupil centred way is far away from the normal practice of the teacher. The gap is too large in order to be bridged by a one-day workshop three times a year. The workshops too much have a one-shot character and can therefore not be expected to be effective (see also Fullan, 1979; Joyce & Showers, 1988). This conclusion is supported by the goals of the workshops which all focus on the content of the teaching guide to be developed.

The teaching guide itself had not been validated, nor designed in a systematic way. It is only evaluated by the teachers, not evaluated when used by the teachers. The observations showed that teachers had a lot of difficulty with performing practicals. Especially the organization of practicals was difficult. Although a lot of teachers stated they use one or more activities they are exposed to during the workshops, one wonders how these activities are used.

Yet, the workshops are highly valued by the teachers and have an important role in giving the teachers the opportunity to meet one another and discuss problems with each other. Teachers also see this as one of the most important purposes for visiting a workshop. They also indicate that a workshop is the most appreciated form of in-service training. When changing the approach one has to take this into account. Next to meeting one another teachers come to a workshop because they have difficulties with the topic dealt with. So also the topic plays an important role.

Recommendations

At the end of this research based on the results some recommendations were made. First of all workshops should deal with the role of the teacher instead of the evaluation of the activities. Teachers should be able to practice their role as a teacher, or at least observe others in that role. The teaching guides should also be more focused on the role of the teacher during the practicals.

The guides should be designed according to a systematic way in which the guide is validated by experts, evaluated by observing teachers and rewritten based on the results of these evaluations. The workshops could also play a role in discussing the experiences of the teachers with the teaching guide.

Next to that the environment should be made more motivating. One thing which should be fairly easy to change is the way the expenditure of the science fees is organized in a school. Science teachers themselves should be dealing with this, so they would know how much is spent and how much still can be spent. This is not the case in most schools at this moment.

One last but major recommendation was that the project should pay more attention to the daily practice of the teachers. One should observe these teachers in class in order to get an idea of this daily practice. This could at the same time act as a way of evaluating the results of the teaching guides or workshops.

It is a difficult task to set up an in-service training with profound goals. There is always the dilemma of how far-reaching a goal should be. How far should these goals be away from the daily practice? Could they not become too easy? Fullan (1991) states that from studies on change it becomes obvious that goals should be substantial, because such projects are more likely to be successful than small-scale, easily trivialized innovations.

Trying to change the way teachers teach asks for a long-term in-service training, in which one uses a developmental approach, building in more and more components of the change over time. This case study gives another example of a project where this was not really the case.

S. Boerma
University of Twente
Faculty of Educational Science and Technology
P.O. Box 217
7500 AE Enschede
The Netherlands
Phone: +31 - 53 - 893578
Fax: +31 - 53 - 329136

Supporting Curriculum Implementation of Physics Teachers in Swaziland

Jan van Hee & Vincent Dorenbos
University of Swaziland, Swaziland

Introduction

In 1985 a high school science and maths in-service project was started at the University of Swaziland. The present project SMART (Science Maths Advice and Regional Training) has as its main aim to improve the instructional practice in the classroom. Presently much 'talk 'n chalk' is taking place in Swazi classrooms. Rote learning and copying of notes from the black board are important characteristics of the teaching that is going on. The project aims for a more meaningful instructional approach which encompasses a more active participation of the student in the learning process. A major strategy embarked by the project in realising this aim is the development of high quality instructional materials and their use in in-service training workshops.

Theoretical background

Instructional materials may make clear what the new approach should look like in the classroom. This so-called exemplary material should then contain a large amount of 'how-to-do advice', as this can be highly effective in reducing the initial implementation problems of teachers (van den Akker, 1988).

Doyle and Ponder (1977-78) pointed out that teachers judge new material from a practical point of view. They mention three aspects of practicality:

- Instrumentality: How clear and specific is the material presented?
- Congruence: How well is the innovation aligned with the teacher's present teaching philosophy and practices?
- Cost: How much extra time and effort does it cost the teacher and how do they compare with the benefits of the innovation?

It is expected that materials alone will not be sufficient for successful implementation in the long run (Roes & van den Akker, 1993). High quality materials can provide teachers with experiences of success in the beginning of the implementation process, but the learning of new teaching roles and methodologies require further support by practice, feedback, exchange of experiences and coaching (Fullan, 1991).

Joyce and Showers (1980, 1988) designed a model for effective training, which is based on a lot of empirical evidence. The main components of this model are: theory, demonstration, practice, feedback and coaching.

In-service training strategy in the SMART project

- *Design of materials*: In the design of exemplary materials attention will be given to procedural specifications like lesson preparation, teaching pattern, subject matter and learning effects.
- *Try out of materials*: The developed exemplary material will be tried out by a few teachers. Their lessons will be observed and (if possible) videotaped with the following aims:
  - to improve the material; problems experienced by teachers can be avoided in an updated version or might be pointed out in the procedural specifications;
  - to provide raw material that can be used during in-service training.
- *First (national) workshop*: After the validation of the material, subject teachers from all high schools in the country will be invited to a one-day workshop at the University of Swaziland in which the following activities might feature:
  - The ideas behind the exemplary material will be explained (theory).
  - Video shots or protocols of lessons in which the material was tried out will be used (demonstration).
  - Participants will be given the opportunity to try out certain parts of the exemplary material (practice).
- *Try out in own classroom*: After the first workshop the participants will try out the material in their own classroom (practice). They will be encouraged to practice together with one or more colleagues (feedback).
- *Second (regional) workshop*: After trying out the material with their own students, teachers will be invited to attend a second one-day workshop where they can share their experiences with colleagues (feedback). The country counts eight INSET schools, which organise regional workshops for their satellite schools. Occasionally during the regional workshop, the leader will be in a position to teach his own students a lesson of the exemplary material (demonstration).

A vulnerable but essential point for the success of this strategy is the availability of student material. Financial resources have still to be secured for this.

Research

Exemplary material on 'reflection', a subtopic of Light, was designed and tried out in the classroom. The unit counts 3 lessons of 70 minutes each. The teacher's guide is integrated in the students' guide. The research reported below, focused on the phase where the material was tried out.

Research questions

Our main research question was:
What is the practical quality of the unit 'reflection' and how can it be improved?

This question was split up into three sub questions:

- Till what extent do teachers execute the lessons in accordance with the intentions of the designers and what are the reasons if they don't?
- How do teachers value the instrumentality, congruence and cost of the unit?
- How do students value the unit?

Methodology and instruments

Five teachers were asked to try out the unit 'reflection'. Three of the nearby teachers were asked permission to attend their lessons and to videotape them.

A curriculum profile was developed to check how close to the designer's intentions the teachers were performing the lessons. A curriculum profile is a description (in operational terms) of lesson elements which are considered to be important to the developers. It gives also a description of the extent to which different ways of realising those elements agree with the intentions of the developers. A distinction is made between: 'threshold' elements (necessary for an acceptable implementation); 'ideal' elements (strengthening the implementation); and 'unacceptable' elements (weakening the implementation).

The teachers were given a logbook to write down their opinions, impressions and suggestions after each lesson.

Two semi-structured group interviews were held after the try-out. One with the three nearby teachers and one with the two far away teachers.

With a questionnaire all students were asked how they experienced the lesson unit 'reflection'.

After the unit, a fair sample of books of the students was checked for having filled in the correct answers.

Results

First research question

Till what extent do teachers execute the lessons in accordance with the intentions of the designers and what are the reasons if they don't?

One of the three observed teachers was executing his lessons in nearly all aspects to a very large extent in accordance with the intentions of the designers.

Although the small group discussion (on questions that reveal students' preconceptions) followed by reporting and class discussion is a teaching method not used often in Swaziland, two of the observed teachers were using this method very well.

Problems observed with at least two of the three teachers were in the area of: handling home work; checking written work; and presenting theory. None or hardly any procedural specifications were provided for these areas in the teacher's guide.

Second research question

How do teachers value the instrumentality, congruence and cost of the unit?

The five interviewed teachers were content with the clarity and specificness (instrumentality) of the material. They were also happy with the content of the guide including the methodologies used (congruence). The teacher's lesson preparation time was less than usual, but some of the teachers were of the opinion that the number of lessons spent on the subtopic 'reflection' is too high.

Third research question

How do students value the unit?

Most students were for a number of reasons happy with the way the lessons were taught.

Proposed changes in unit 'reflection'

- Some additional practical hints will be given in the areas of handling home work, checking written work and presenting theory.
- Some minor changes to the guide's content will be made.
  Example: the proposed demonstration was qualitative. Teachers showed that it is very well possible to do the demonstration in a quantitative way.
- Some extra subject background will be given to the teachers.
  Example: Teachers were provided with some misconceptions of students on light as well as with some strategies to tackle these. During a class discussion an another interesting misconception appeared. This misconception was addressed convincingly by a fellow student. This misconception as well as the way how to address it will be included in the background provided for the teachers.

Oncoming in-service workshop

A possible programme will be presented of the oncoming one day national workshop in which the validated unit 'reflection' will be introduced. Parts of the collected video material and protocols will be used. Some video material has been identified that shows: exemplary performance of teachers in a variety of skills; exemplary input of students; and different kinds of problems students have with the subtopic reflection.

J. van Hee & V.J. Dorenbos
CDCS/VUA
De Boelelaan 1115
1081 HV Amsterdam
The Netherlands
Phone: +31 - 20 - 4449090
Fax: +31 - 20 - 4449095

Curriculum reform in Namibia

Wout Ottevanger
INSTANT project, Ministry of Education and Culture, Namibia

Introduction

Namibia gained its independence from South Africa in 1990. The new government declared education as one of its priority areas. Up to that time education was a privilege for a small minority group of the population. Very few children went to school. Basic literacy and numeracy was deemed sufficient for most population groups. Education is now considered to be a basic human right and available to all people. Primary education is compulsory. The Ministry of Education and Culture in Namibia introduced a new curriculum for all subjects. The new curriculum was introduced as promoting learner-centred teaching and was a move away from the usual practice of rote-learning.

Implementation of curriculum innovations in the classroom

The ministry appreciates the central role teachers play in both the design and the implementation of the curriculum. Teachers must be involved throughout all its stages from pre-study (research), initial draft, trials, refinement, implementation, monitoring, and evaluation. While the literature acknowledges the central role the teacher plays in curriculum implementation, it is clear that it is not always easy for teachers to come to grips with goals and objectives of curricula. Teachers often have a poor understanding of aims such as 'problem solving' and 'critical thinking' , which so often appear in today's curricula. To translate these aims and objectives in operational terms is not an easy task for untrained and inexperienced teachers.

Goodlad describes the various stages in a curriculum including from the *ideal* curriculum, as it was intended by the developers, to the *operational* curriculum, as it is put in practice by teachers in their classrooms. In many cases there is a substantial discrepancy between the various stages of the curriculum. What is being implemented is often only a vague representation of the curriculum intended by the developers. Especially in the very beginning of an implementation of a change in the classroom successes are needed to help reduce the insecurity of the teacher about the change.

The ministry has established several projects for to guide the introduction of the new curriculum in the classroom. One such project is the INSTANT Project, which offers assistance to science and mathematics teachers.

INSTANT Project

The INSTANT Project is providing assistance to the Ministry of Education and Culture in Namibia with the introduction of the new curricula for science and mathematics in secondary schools. The activities of the INSTANT Project can be divided in three main areas:

- **INSET activities (national and regional workshops, cluster meetings);**
- **Infrastructure (development of a cascade model for in-service activities and building up of capacity in the regions);**
- Materials (development and dissemination of equipment, books and teacher support materials).

The 'materials' section of the project has received a great deal of attention due to the lack of:

- the most basic facilities in school preventing teachers doing any type of practical activities with their learners;
- textbooks appropriate for teaching the new syllabus;
- teacher support materials to help teachers with the implementation of the new curriculum in the classroom.

The INSTANT project has been developing teacher support materials, mainly teacher guides for maths and science. These support materials, tried out in workshops, are valued highly by the teaching force. The support materials were in the initial stage of the new curriculum, in the absence of textbooks, often used as learner materials, parts of the materials were used as distant learning materials. Systematic feedback on the use of the teacher support materials in the classroom and how they contribute to the implementation of the new curriculum, has not yet been collected.

Development research

To design of teacher support materials which help with the implementation of the new curriculum the INSTANT Project has adopted a *developmental research* approach. An outline of its methodology is characterised by the following activities:

- Selection of a limited number of exemplary themes;
- Standardisation of the structure and design of the modules applying basic principles on materials and text design;
- Provision of *procedural specification* for lesson planning and lesson execution to facilitate the implementation of curriculum innovations in the classroom;
- Systematic and efficient formative evaluation of the modules.

As a result development research is likely to:

- increase the efficiency of the development process;
- increase the quality of the materials;
- reduce the uncertainty in decision making, thus increasing the degree of implementation;
- stimulate professional learning of all participants, including teachers, who will, among others, get a better understanding of how the specific activities evolve form the curriculum.

Research methodology and instruments

The core of this study includes the cyclic design and formative evaluation of a prototype teacher guide. The formative evaluation of the guide takes place in schools in two different educational regions. The two regions chosen are very different in terms of teacher qualification and experience, English proficiency of teachers, school management and physical facilities of the schools.

A curriculum profile is used as the basis for the instruments for data collection. A curriculum profile is an instrument to evaluate the operational curriculum. Such profile includes the essential lesson components which are considered essential by the designers, and a description of possible configurations in realising those components, with a differentiation between:

- threshold elements (necessary for acceptable implementation)
- ideal elements (strengthening the implementation)
- unacceptable elements (weakening the implementation)

In this study the curriculum profile helps to translate the curriculum into specific activities in the classroom and to evaluate the curriculum in action. The curriculum profile was used as the basis of most of the instruments for data collection, including:

- classroom observation - systematic classroom observations of a number of the lessons as proposed in the prototype teacher guide;
- many of the observed classes were videotaped. Videotaping classes gave the opportunity to capture possible exemplary teaching. Edited video fragments may be used in in-service activities;
- teacher logbook - all participating teachers kept a logbook of all lessons proposed in the prototype teacher guide;
- teacher interviews - at the end of the lesson series teachers will be interviewed;
- learners questionnaire - learners perceptions of the lesson series will be collected by a questionnaire at the end of the series;
- learners interview - a few learners from each class were selected for an interview at the end of the lesson series.

The presentation will report on the results of the first iteration of the proposed cyclic design and formative evaluation.

W. Ottevanger
Instant Project
P/Bag 12027
Windhoek
Namibia
Phone: +264 - 61 - 215670
Fax: +264 - 61 - 215620

CASCADE: Computer ASsisted Curriculum Analysis, Design and Evaluation: A Development Research Project

Nienke Nieveen
University of Twente, the Netherlands

Introduction

In this paper we will report about a collaborative study of the University of Twente (Faculty of Educational Science and Technology, Department of Curriculum) and the Dutch National Institute for Curriculum Development (acronym SLO). In a four year development research project we will develop a prototype (with complete and tested specifications) of an electronic performance support system called Computer ASsisted Curriculum Analysis, Design and Evaluation (CASCADE).

With the development of CASCADE we aim at exploring the supporting role of the computer contributing to quality improvement and more efficiency of curriculum development activities. Gery (1991) distinguishes three components of an electronic performance support system (EPSS): an infobase, advisory system and computer based training. In CASCADE the first two components will be stressed.

CASCADE will have an initial focus on the component of formative evaluation. We have chosen for this component because until now it hasn't had the emphasis it deserves in the SLO curriculum development activities (van den Akker, Boersma & Nies, 1990).

Method

Because of the many uncertainties concerning the formulation of procedural recommendations for curriculum development activities and the development of the computer support system, we have decided to follow a development research methodology.

A preliminary study (van den Akker, Nieveen & Plomp, 1993) on the possibilities of computer supported curriculum development resulted in a set of recommendations for the design of such a system for the development activities of the SLO. In close interaction with curriculum developers (the target group) these findings will be elaborated and evaluated, so that the content of the support system and the support system itself will evolve. Besides a final prototype this kind of research also aims at contributing to the methodology of designing such computer support systems.

Because of the importance of involvement of the target group during the development process, in an early stage a user group of curriculum developers was formed. The role of the user group is to provide feedback on every prototype and to suggest possible improvements for the development of subsequent prototypes. Prototypes will also be evaluated formatively by finding out how curriculum developers use the computer support system and by asking other experts to give their judgement on it.

Results

By August 1994 the first prototype will have been developed and tested. In the paper we will discuss the evolvement of the functionality and technical aspects of Cascade as well as the results of the development and formative evaluation activities.

N.M. Nieveen
University of Twente
Faculty of Educational Science and Technology
Department of Curriculum
P.O. Box 217
7500 AE Enschede
The Netherlands
Phone: +31 - 53 - 893625
Fax: +31 - 53 - 329136

DATE: Design Approaches in Training and Education

Irene Voerman
University of Twente, the Netherlands

Introduction

In this paper, we will reflect on the first stage of the research project 'Design Approaches in Training and Education'. This project will become part of a University Research Program on Design Approaches in the Social Sciences, that aims at the development and specification of a design methodology for the social sciences. Starting point for this University program is the diagnosis that there are interesting, successful, and relevant professional design activities in social practices, but that existing design methodologies and models do not fit practice adequately. On the one hand this may be due to insufficient insight and unsystematic exploration of what really happens in practice, on the other hand it may be due to incomplete and inadequate theories on designing. By relying on more adequate theories of designing (in the program, Schön's work (1983, 1987) is assumed to be the basis to start from), and by reconstructing successful design processes in practice, new knowledge may evolve that leads to a more appropriate methodology for the social sciences.

Design of the research

The main questions that guide the research are:

- What are the professional design processes and practices in various education and training contexts?
- What are potential improvements of the design methods in those domains?

Roughly, the DATE-project consists of three stages. The first stage has been reserved for a literature study on design. Also, 14 training or education design experts (9 Dutch and 5 American experts) have been interviewed about their views on design and their design approach.

In the second stage of the project, empirical information will be gathered in specific design projects. Based upon findings from a survey, successful design projects will be selected. Reconstructions will be made of the design process in these projects, guided by questions like 'What kind of activities are carried out, with what reason, for what purposes, with what frequency and intensity? How do design team members interact with each other? How are specific problems solved? What stakeholders are involved in the process, when, how and with what intention?, etc.

In the third stage, based upon findings in the second stage, efforts will be made, in interaction with professional designers, and utilizing knowledge from other design oriented research, to generate and test proposals for the improvement of a design methodology in education and training.

Results

This paper will reflect the findings and conclusions of the first stage of the project. In comparison to theory on design, a summary will be given of the findings in the interviews with experts from different education and training settings, such as educational publishers, courseware developers, external and internal consultants for education, training, and development. While articulating and comparing design processes in these different settings, attention will be paid to, for example: design and evaluation methods; criteria for quality, effectiveness, and efficiency; involvement of clients; etc. The gained insights will result in a conceptual framework that will guide the second stage of the project.

J.L.A. Voerman
University of Twente
Faculty of Educational Science and Technology
Department of Curriculum
P.O. Box 217
7500 AE Enschede
The Netherlands
Phone: +31 - 53 - 893625
Fax: +31 - 53 - 329136

Supporting the Quality Improvement of Curriculum Development of the National Institute for Curriculum Development (SLO)

Kerst Boersma
National Institute for Curriculum Development, the Netherlands

Introduction

The SLO, founded in 1976, and largely financed by the national government, has carried out a large number of curriculum projects in elementary, secondary, vocational and adult education. After 10 years of curriculum development there was increasing concern that much of the expertise acquired in projects was not available in a written form. There was no reliable and systematic overview of successful and less successful curriculum strategies.

After a problem analysis and the construction of a conceptual framework, a retrospective study was conducted of a representative sample of 18 completed curriculum projects (van den Akker, Boersma & Nies, 1990; van den Akker & Boersma, 1993; van den Akker & Nies, 1992).

Some of the more striking results were that in many of the projects, there were difficulties in determining the target groups and product specifications, and in planning the project preparation. In many of these projects, it was not clear how to anticipate dissemination and implementation. In many cases formative evaluation of the feasibility of the curriculum proposals was rather superficial, since this evaluation was not or only occasionally derived from classroom observations and test results. The general view was that curricular decisions were based on a limited degree of rationalism and that the curriculum practice could be characterized as 'intuitive'.

When the results of the case study research were published our recommendations received little support. Only the Department for Research and Development (R&D) took new initiatives (Boersma, 1992). In the meantime curriculum departments took initiatives to reduce the duration of projects and to strengthen the project management. Until recently, however, strong policies favouring the instrumentation of curriculum development were absent.

Changing conditions

During the last few years conditions in the external environment of the SLO changed considerably. A first change is the increasing importance of demand generated (and financed) curriculum development. A second change is a gradual decrease of the budget furnished by the national government. Both changes resulted in an increase in pressure on the efficiency of curriculum development and a need for further product diversification.

A third change is the increasing autonomy of the school. This process, which starts in vocational education, seems - among others - to be accompanied by a growing interest in quality management. This change in beliefs of our target groups influences our own interest in quality management.

Leading question

The first two changes, mentioned above, led to a reorganization of the SLO in 1993. As a part of the reorganisation the task of the R&D Department has now been defined as supporting the quality improvement of curriculum development.

Following this definition the following leading question is discussed:

- How can the quality of curriculum development be improved and what can be the policy of the R&D Department to offer effective support?

Supporting quality improvement

The policy of the R&D Department is to support on application. Support on application means elaboration of suitable solutions for problems formulated by the applicants. Applications are formulated by the general director and the heads of the curriculum departments. The quality of the curriculum development belongs to the responsibility of the heads of the curriculum departments. The R&D department takes only initiatives to a limited extent.

The SLO has an extensive quality support system. Consequently, in the definition of the support the actual quality support system and the existing curriculum practices have to be taken into account. In the report of the case study research of the curriculum practice was characterized as 'intuitive'. Such a characterization is not functional in defining support.

Important variables in the definition of support are:

- Approaches of curriculum development;
- Approaches of project management;
- Types of curriculum publications;
- Types of curriculum developers;
- Approach of quality.

In the definition of support the following argumentations are gaining importance.

- Curriculum developers in SLO have to be considered as autonomous professionals. It makes sense to manage them on the definition of the input and on the output of curriculum development, and not on throughput (as curriculum strategies).
- Quality of curriculum development is not limited to curriculum strategies. Project management, and other conditions influencing the quality have to be taken into consideration. Quality improvement of curriculum development also includes organization development.
- The definition of the support is considered from an implementation perspective. In many cases research is only a starting point. It will be considered as an empirical basis

for an advice and can be followed by the development of tools or an in-service course and/or consultancy.

Issues and means

The R&D department offers support on the following issues:
quality management, curriculum design, input evaluation, formative evaluation, summative evaluation, project management and general educational issues.

In defining the support the following means are used:
research, construction of tools, construction of automated or computer supported tools, in-service training, advice and consultancy.

It will be evident that the quality of the support depends to a large extent on the available expertise and budget. For the R&D department, as a small unit, that means that cooperation with universities and other research institutes is indispensable.

K. Th. Boersma
National Institute for Curriculum Development (SLO)
Research and Development
P.O. Box 2041
7500 CA Enschede
The Netherlands
Phone: +31 - 53 - 840840
Fax: +31 - 53 - 307692

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Design of multifunctional courses/modules

P. van Eijl and H. Balsters
University of Utrecht, the Netherlands

Introduction on multifunctionality

In many Dutch higher education institutes (universities or polytechnics) a number of courses (often called modules) are offered to students with different study backgrounds. This occurs because of the enhanced flexibility in the curricula, economic motives (better use of resources) or because of the general, more universal or interdisciplinary contents of the modules. This type of module is called multifunctional.

Central question of research

Because of this development many teachers are confronted with the problem of "how to design an effective multifunctional module?" A research project was started to develop a tool for teachers to design multifunctional modules.

Methods and results

The literature study carried out resulted in some worthwhile information especially on interdisciplinary modules. The most interesting part of this project were some in-depth interviews with 24 teachers of different disciplines in higher education. The analysis of these interviews showed that there was not one special approach to designing multifunctional modules. More than 20 different strategies were identified, used by teachers to allow or enhance the multifunctional use of their modules. A further analysis of these strategies divided them into seven categories, which have been arranged and summarized in a single picture: the staircase of multifunctionality. Teachers can use this as a tool in designing multifunctional modules. This staircase of strategies together with illustrative examples from the interviews is presented in this paper.

P.J. van Eijl and H. Balsters
University of Utrecht
IVLOS Institute of Education
Heidelberglaan 8
3584 CS Utrecht
The Netherlands
Phone: +31 - 30 - 531968
Fax: +31 - 30 - 532741

The Role and Influence of Interest Groups in the Development of Classroom Materials to Support Curriculum Innovation in Religious Education

Judith Everington
University of Warwick, England

Context - The Warwick Religious Education Project

The WREP is one of a number of projects currently undertaken by members of the Religious Education and Community Project based at the University of Warwick, England. The RECP's two major areas of interest are represented by its ethnographic studies of religion in the community and its theoretical work within religious education.

Curriculum development brings together work undertaken in these two areas. Thus, the Warwick Religious Education Project draws upon ethnographic studies of children's experience of religious nurture and upon theoretical work in religious education to develop an innovative approach to the exploration of religions in state schools. The greater part of the team's work involves developing curriculum materials to support teachers and pupils.

Much of what has been written (i.e. published), descriptively and analytically in the area of curriculum development projects does not apply to our own situation as a curriculum development project or to our own experience of curriculum development. (Most of the literature examines large-scale and highly organised CD projects or looks at in-school development).

However an American, D.F. Walker, has written on work which does parallel the RECP situation - he examines small scale projects originating in Higher Ed. institutions and seeks to challenge existing "rational-scientific" theories of CD by drawing attention to the way in which many CD teams actually work. His chapter in Reid and Walker (eds), "Case Studies in Curriculum Change" (1975), uses an examination of an Art CD project based at Stanford University to explore and elaborate his thesis which appears first in a paper of 1971.

Walker argues that CD is often accomplished by working through a process which begins with and remains undergirded by a "platform" of shared theory, aims etc. - this is typically provided by the originator and director of the project who often selects his team from those who are supportive of the "platform".

In the course of development however, this "platform" must be interpreted and elaborated so that the practical problems and pedagogical (occasionally theoretical) concerns/questions of the team can be addressed and resolved. (In the Art CD project there was a tendency to produce materials first and then raise problems, concerns and issues). The process by which the team addresses and resolves these matters is termed "deliberation".

Walker analyses "deliberations" in fine detail (using transcripts from team meetings) and concludes that this is a necessary, indeed vital stage in curriculum development - often ignored by analysts of curriculum development projects.

Clearly, much of what Walker describes/analyses is relevant to the RECP situation. Several commentators have also highlighted the importance of following up his research and conclusions. However, Walker's 1975 case study does differ in some respects from the RECP situation.

- The 1975 case study drew upon observations of the regular whole team meetings that took place. It was during these meetings that the all important "deliberations" took place.
- The 1975 study was concerned with the interaction between individual "insider" members of the project team. The role and influence of "outsider agents/agencies" was not relevant and did not feature in the analysis.

As I believe that "outsider agents/agencies" have been influential in determining the pace and nature of the RECPs' own CD work, it will be necessary to bring these into my analysis as participants with their own platforms. The fact that they are not insiders will be shown to affect the nature of deliberations in different ways (i.e. the power/status held by the pubs is great while the power/status of the families/community. At the same time, the process of developing these strategies has proved to be time consuming and not infrequently, stressful and individual members of the team are continuing to adjust to the demands of their own roles, as negotiators.

Research Methods

Participant observation; analysis of documents; analysis of audio-taped interviews and meetings.

J. Everington
University of Warwick
Department of Arts Education
Westwood Site
Coventry CV4 7AL
United Kingdom
Phone: +44 - 203 - 523523
Fax: +44 - 203 - 524209

The European Dimension in the New Foreign Language Curricula in Romania

Anca Dumitrescu
Institute for Educational Sciences, Romania

A thorough education reform as the one already started in Romania should be based on conceptual changes concerning the educational system on the whole, implying a unitary outlook with specific implications and manners of manifestation within each of its structural and functional components.

At the content level, one of the main reference stages is represented by the elaboration of a well-grounded, up-to-date conception on school subject-matters, on their constituent parts, as well as their complex valences and finalities.

It has become more and more obvious that new types of curricula should be introduced in the Romanian school life. They have to represent:

- the best way of defining the content of a school subject (observing firm, scientific criteria);
- the stage for preparing the education content to become operational and afterwards progressively implemented into the teaching/learning process;
- a steady, deeply-grounded basis for writing new textbooks, workbooks and other school materials.

Among the activities carried out by the staff of the Romanian Institute for Educational Sciences, the elaboration of school curricula for pre-university education represents an important professional task. Several research projects have already started, being focused on curriculum development at the level of primary and secondary education, for various compulsory school-subjects.

The Modern Language Project has its own configuration, trying to set up a common language policy in the foreign language teaching processes, closely linked to the new educational objectives in post-revolutionary Romania.

This paper intends to present the various stages of this research project dealing mainly with the formulation of the new attainment targets/core objectives, as well as the design of the curricular content for modern language teaching in upper secondary education.

Our activity has been focused on two basic directions:

- to take over the valuable traditions existing along the years in the Romanian practice of teaching foreign language and develop them further according to the requirements of the new educational approaches in today's Romania.

- to introduce new-curricular contents of a growing interest and particular significance for the training of our pupils in the spirit of a free democratic society within nowadays changing Europe, for tomorrow's dynamically evolving community.

Much work has been performed especially in the latter direction to outline several new areas of study, illustrated with a number of possible topics. These are designed to help teachers and learners to work out schemes of work, which reflect their own situation, and writers of course materials to create resources for supporting them in this important task.

Trying to identify priority areas of curricular content at the level of upper secondary education, we have agreed that the promotion and development of the European dimension should be of particular significance in the process of teaching modern languages to the teenagers of a country kept in dark isolation for so many years of totalitarian dictatorship, and now willing to open its social-economic and spiritual boundaries towards the surrounding Europe.

So, most of this paper will deal with our theoretical and practical approaches aiming at transferring and incorporating in the new modern language curricula (grades 9-12), the concept of the European dimension of education materialized in its 3 main components (as defined by Stobart, M.: "Preface", in Shennan, M.: "Teaching about Europe", p. 15, 1991):
- education in Europe;
- education about Europe;
- education for Europe.

Thus, we shall discuss our viewpoints on possible efficient ways of introducing factual knowledge on the European dimension into the new curricular structures. For example, the concept of "Education about Europe" can be taught within several areas of study concentrated on various topics. So at the level of the study area "The People around Us" it may be dealt with in the topics on geographical and historical facts, environmental issues, communication facilities, Europe's youth and its major problems today, cooperation and conflicts. a.s.o.

Of much concern and greater difficulty is to define the specific manners to be used for developing pupils' abilities to operate ways of discovering and understanding the European dimension at various life and activity levels, for increasing their European awareness and training their intercultural competence, for helping them develop inner motivations, constructive attitudes, critical evaluations. Our paper will make adequate references in this respect, too.

Although most of our research work has been focused on modern language curricula for general secondary education, several considerations will be also put forward in connection with technical schools, which equally need the promotion of the European dimension in their foreign language curricula.

A. Dumitrescu
Romanian Inst. for Educ. Sciences
Curriculum Development
37, Stirbei Vada str.
70732 Bucharest
Romania
Phone: +40 - 1 - 6332527

Language Teaching and Curriculum Policy in Hungary

Anna Imre
Hungarian Institute for Educational Research, Hungary

The paper is an attempt to describe the changes of language education in the light of the changes of curriculum policy in Hungary and tries to demonstrate that language education reflects curriculum policy through the history of both.

Curriculum policy after 1945 can be described as a process of centralization till 1953, from this point it shows a slow decentralization.

After the 2nd World War, the Government administration took full control of handling both the organization and contents of education, the society lost its control over the selection of the contents of the study.

The right to control the contents of the curriculum after 1949, the "year of change" shifted entirely into the sphere of the party apparatus. This resulted in such a degree of concentration of power, that in these years the education process was able to function without actually having formally valid curricula. After Stalin's death a kind of slow decentralization took place in the control of education with the reorganization of some professional organizations. The members of these organizations took part in the making of curricula, but accepted the primary of policy makers and administration of education in the questions. Important changes, reforms in education were usually preceded by a party decision, elaborated by the experts of the given field.

Curricula were elaborated by pedagogical institutions from the second half of the 50s. The curricula prescribed, required methods and teaching materials in great detail. In practice these instructions were not taken too seriously toward the end of the whole period.

After 1989, the change of the system and the new education act there is great liberty for schools to decide in many things, in the questions of curriculum too.

The history of language education shows a similar process of decentralization of curriculum control, a growth of autonomy of schools. The Russian language was introduced as a facultative subject in 1945, it was made compulsory in primary and secondary education in 1949, the "year of change". Great efforts were made to train teachers in great number to be able to fulfil the aims of this decision. From 1955 and 1957 in particular the former curriculum of Russian language was considered to be maximalist, since then reductions of the content of teachers took place from time to time.

The introduction of a 2nd language besides Russian took place in 1955 in grammar schools and in 1980 in primary schools. Schools with special language education programs were allowed to start at the end of the 60s. The demand for learning other foreign languages than Russian was even greater than the opportunities, language schools appeared in increasing number in the second half of the 80s.

Today, after the Russian language was abolished as a compulsory subject schools are free to decide which language they want to teach. This situation results in great variety in language offerings in several respects, the situation is formed mainly by the "market", the demand for each languages.

A. Imre
Hungarian Institute for Educational Research
P.O. Box 427
1395 Budapest
Hungary
Phone: +36 - 1 - 1297652
Fax: +36 - 1 - 1297639

Researching Values Education in Primary Schools

Pamela Munn & Margaret Johnstone
Moray House Institute of Education, Scotland

Mairi-Anne Cullen
Scottish Council for Research in Education, Scotland

This paper reports work currently in progress on a project called Understanding Values Education in the Primary School. The research by the Gordon Cook Foundation, a charitable trust. The paper describes our conceptualization of values and of values education and then relates this to a rationale for case study work in five primary schools. A range of methods is described including semi-structured interviews with teachers, classroom observation, reflective interviews with teachers, group discussions with pupils and interviews with parents. The paper will raise issues about the kinds of data elicited from these methods and about analysing such data to provide understanding of values education.

The paper is divided into four sections.

Conceptualisation of Values and Values Education

In thinking about values one immediately confronts the key question in moral philosophy, 'How ought we to live?' Considering this question then leads into abstract discussion about what it is for something to be good or bad. These questions continue to interest philosophers and one needs to be aware of their answers in researching values education in schools but the questions are at too abstract a level to guide empirical research.

Our starting point was with schools and a recognition that schools cannot be value free. Furthermore values education can take different forms, the explicit curriculum, the informal curriculum and the hidden curriculum. Our aim was to understand values education in schools and to help us develop our research design and methods we conceptualised values as follows:

- as encompassing different areas of belief, not just being concerned with morality but also concerned with aesthetics, technology, religion and politics;
- as being expressed at different levels;
- as involving cognition, emotion and action.

The Research Strategy

This puts forward the argument for a case study approach and describes the criteria on which the primary schools were chosen. Although the case being studied is the school as a whole, different aspect of school life are the focus of research given our conceptualization of values. These aspects include the overt curriculum, the informal curriculum and the hidden curriculum.

Research Methods

A wide range of research methods is being used. These include semi-structured interviews with teaching and non-teaching staff about the explicit, informal and hidden values curriculum; reflective interviews with a small number of teachers asking them to talk about a particular segment of their teaching and its concern with values; group discussions with pupils designed to explore their perceptions of the values being promoted by their teacher and the school as a whole; a written exercise by pupils asking them about values; semi-structured interviews with parents of pupils involved in the groups discussions; a study of school documents and teachers' curriculum planning; and field notes designed to capture evidence about authority and power, roles and relationships and other aspects of school life.

Analysis - Understanding Values Education

This section discusses the ways in which data collected by the range of methods are analyses and used to inform each other so that the following research questions are answered.

- What kinds of values do primary teachers see themselves as trying to teach their pupils?
- How do they do this? For example, through school discipline policy, through an explicit curriculum of personal and social education and religious and moral education and/or through subjects without an explicit values label.
- What rationales do they offer for teaching values and what do they see as its purpose?
- What kinds of teaching approaches are used in the context of values education and why? Are these the same as or different from other teaching approaches and why? In particular how do teachers deal with pupil questioning or rejection of certain values?
- Do teachers agree (a) about the kinds of values to be taught and (b) the teaching approaches to be used? By what processes is such agreement reached? If there is no agreement, what prevents consensus emerging?
- Are pupils aware of values education? Do they see a relevance to life outside school?
- Have the schools involved parents in values education? If so in what ways? If no, why not?
- Is the broader community involved in any way?

P. Munn & M. Johnstone
Moray House Institute of Education
Teaching Studies
Holyrood Campus
Holyrood Road
Edinburgh, EH8 8AQ
Scotland
Phone: +44 - 31 - 556 - 8455
Fax: +44 - 31 - 557 - 3458

Mairi-Anne Cullen
Scottish Council for Research in Education
15 St. John Street
Edinburgh EH8 8JR
Scotland

Realistic Mathematics

Jo Nelissen
The Foundation for School Counseling Service Utrecht, the Netherlands

Welco Tomic
The Open University, the Netherlands

This article deals with the 'realistic' school, which has brought about far-reaching changes in mathematics education. Two factors have had a significant influence on the development of this school: in the first place mathematicians who came to have a different view of mathematics and, in the second place, our knowledge about how children learn mathematics, to a large extent derived from cognitive psychology and the cultural historical school. This article concentrates on mathematics learning and education in primary school, using three key concepts: construction, interaction and reflection or metacognition. The article then proceeds to explore which cognitive processes are fundamental to solving mathematics problems, and, finally, discusses developments within the field of educational psychology which may be of relevance to mathematics education. Although the theoretical basis for construction, interaction and reflection is quite solid and there is a high level of agreement on the three concepts, more research is needed at all levels of mathematics education, in order to increase our understanding of these cognitive processes and the role that they play in mathematics learning and education.

W. Tomic
Open University
Social Sciences Department
P.O. Box 2960
6401 DL Heerlen
The Netherlands
Phone: +31 - 45 - 762539
Fax: +31 - 45 - 762939

Designing Sound
Computer Support for Creativity in Music Education

Phil Ellis
University of Warwick, England

Traditional methods in music education tend to place an emphasis on acquiring skills first, and only then gaining in musical experience through practical activity.

Technology allows us to create directly into sound and has enabled the development of a new and radical approach to music education through composing as a practical, not symbolic, activity. The belief that everyone is musical is common to many philosophies of music education, and an approach which utilises the power of technology can enable people to realise and actualise their own musical thoughts, often for the first time.

Most computer music programs are not designed for education, and reflect their commercial-world roots - a concern with product not process. Producing a 'simplified' version of such a program does not then make it suitable for education.

Composing, or creating in sound, is now a compulsory element of music education in the U.K. for pupils from age 4 to 14, and we need a model of the creative process which gives structure to this activity for pupils at all stages of development. A three-stage spiral model of creativity is proposed:

- Exploring, in which experiments are made with sounds and different combinations of sounds - a vocabulary for the intended composition is developed.
- Focusing, where ideas are tried out; evaluated and refined: - this is a period of incubation and development.
- Realising, where ideas finally come together and a musical product is formed - a composition.

After subsequent analysis, appraisal and reflection, the cycle starts again with further, perhaps more complex and ambitious composing projects.

In 1988 a three-year research and development project was begun, based at the University of Warwick, initially funded by the Microelectronics Education Support Unit (MESU), subsequently the National Council for Education Technology, (NCET). Initially we involved seven schools, chosen from primary, special needs and secondary phases of education. A programme was initiated which combined observational, case study and action research methodologies. Much data was collected in the medium of video which forms a substantial part of the publication and dissemination aspects of the project.

This initial phase of the project resulted in the publication of Touching Sound, comprising music computer programmes confined to the Acorn BBC computer, and a 90 minute video programme which included case study material from schools involved with the project. Basic principles and a possible modus operandi for computer music software were a focus of this phase including an examination of a variety of interface devices - alternative musical instruments! The program works entirely in the medium of sound and took the model of development through creativity described above as the basis for its design philosophy.

In 1991 a two-year extension of the project enabled the software design to be further developed and extended significantly. It was also implemented to exploit MIDI-based systems for Atari, Amiga, Acorn Archimedes and IBM PC 286 platforms, with extensive trialling in schools and colleges in many areas in the UK. The program is simple enough for four year old children to use independently of a teacher, yet at the same time challenges advanced music students.

The project concluded with the publication of this software, Designing Sound, and a book with the same name which give support to creativity in music education and technology. This aims to enable specialist and non-specialist teachers to move towards developing the necessary skills, confidence and sensitivities for creative curriculum practice in music with children and was developed in close consultation with teachers and children in a number of schools.

Browning's plea for 'a man's reach to exceed his grasp, else what's a heaven for?' is significant. As the twenty-first century approaches we are indeed grasping more, yet at the same time our reach is extending into unimagined territory. Powerful technological tools demand thoughtful development of philosophy and careful implementation of methodology in aesthetic, creative, musical and educationally sound ways.

P.V. Ellis
University of Warwick
Department of Arts Education
Westwood
Coventry CV32 6EE
United Kingdom
Phone: +44 - 203 - 523631
Fax: +44 - 203 - 524209

An All-Elective Curriculum

Chair: Pinchas Tamir
Hebrew University of Jerusalem, Israel

Introduction

Traditionally students in a particular class or a particular course study the same program. More recently, in some cases, some parts of the program were considered as the core and others as electives. In these cases all the students study the core topics and different students study different elective topics according to their interests, abilities or some other characteristic. Two years ago it was decided in Israel to install a new kind of curriculum in which all topics were electives. The papers that are presented here summarize our observation of the implementation of such a curriculum in biology in Israeli schools.

All-Elective curriculum: Rationale and Basic Assumptions

Pinchas Tamir & Bruria Agrest
Hebrew University of Jerusalem, Israel

The paper described briefly the topics, the organization and other characteristics and explains the benefits as well as some of the problems encountered.

Patterns of Selection and the Reactions and Views of the Teachers

Bruria Agrest & Pinchas Tamir
Hebrew University of Jerusalem, Israel

This paper elaborates how teachers experience the new curriculum and what their views are.

Adapting Assessment to an All-Elective Curriculum

Dida Frankl, Ruth Amir & Pinchas Tamir
Hebrew University of Jerusalem, Israel

This paper will describe how the matriculation examination was adapted to the new curriculum, some of the problems that were created and some of the solutions that have been tried.

P. Tamir
Hebrew University of Jerusalem
Israel Science Teaching Center
91404 Jerusalem
Israel
Phone: +972 - 2 - 661774
Fax: +972 - 2 - 585708

Post-Modern Order and a Curriculum From Transmission to Transformation

Tero Autio, Raimo Jaakkola & Eero Ropo
University of Tampere, Finland

The main task of our paper is to explore the scope and the contents of the changes of present life and how these global and local changes reflect on the level of curriculum theory. School as an educational institution emerged in the era of social stability. Curriculum theory represents this same philosophy.

Change is the main characteristic of the modern society. For instance Anthony Giddens (1991) has characterized the dynamism of modernity by three major influences which all have a direct impact on the curriculum theory. First of those is the separation of time and space. In the pre-modern eras, time and space remained essentially linked through place for most people and for most of the ordinary daily activities. Separation of time and place makes up for the first time in human history "the condition for the articulation of social relations across wide spans of time-space, up to and including global systems" (ibid. 20). This fact challenges education to reconsider its attitude towards separation of time and place in the educational processes.

The second major influence on the dynamism of modernity which is crucially dependent on the first one is the disembedding of social institutions. In Giddens´ theory this means the "lifting out" of social relations from local contexts and their rearticulation across indefinite combinations of time and space. Disembedding is the key to understand the nature of post-modern institutions. Disembedding mechanisms are of two types: "symbolic tokens" and "expert systems" which Giddens collectively refers to as abstract systems. The very same disembedding mechanisms which provide options and possibilities (e.g. the free flow of information, ideas, images, capital, technologies) are creating risks and hazards which may be local or global. The challenges of those phenomena for curriculum are myriad. Distributed expertise in the school context might result in several changes in the roles of teachers, students, and stakeholders of the school.

The third major lever of the dynamism of modern institutions is according to Giddens the thoroughgoing reflexivity. It refers to the susceptibility of the aspects of social activity and material relations with nature. Reflexivity means the need for chronic revision in the light of new information or knowledge. It regularizes the use of knowledge about circumstances of social life as constitutive element in its organisation and transformation.

However, Giddens theory of the dynamism of modernity has raised up some criticism. Perhaps the most recent one, Lash and Urry (1994), consider Giddens overemphasizing the cognitive aspect of the change mechanisms. Parallel to the phenomenon of cognitive reflexivity and equally important development in late modern societies is the pervasion of aesthetic reflexivity. Cognitive reflexivity is a matter of monitoring of self, of social-structural roles and resources. Aesthetic reflexivity entails self-interpretation and the interpretation of social background practices.

This is the background in a nutshell for the need of a 'contingent' curriculum theory. "Contingent" in the sense that there is no more a single best organizational form for learning, curriculum planning or educational policy.

Contingency due to permanent change urges the shift from the transmission model of learning and teaching to the one of transformation. First, this move presupposes a new epistemology, which is more generative than representational: it goes beyond the assessment how accurately our ideas and facts mirror reality. Such an epistemology will deal not merely with truth but with complexity, indeterminacy and paradox. Second, in this frame, where curriculum becomes process, the traditional dichotomy between ends and means loses its curricular impetus. Goals and ends as guiding beacons of our curricular actions do not just appear from the realm of ethics or from society, but they are personal decisions made by cultural beings at historical moments. Contrary to the closed system approach where learning means receiving or discovering of pre-established sets of knowledge, in a transformative curriculum goals, plans and purposes arise not purely prior to but also from within action. In Deweyan sense the plans and actions are interactive: plans arise from action and are modified through actions. Thirdly, the very means of education and learning, the teacher-student relations transform from informative and unilateral to transactive and bilateral. Teachers´ desired qualities include not only good exposition but also listening and interaction skills. Traditional conception of curriculum view reality as discrete phenomena that are reflected as different, even isolated subject matters. This curricular solution assumes a stable reality which can be best comprehended by dividing it into parts according a model of classical natural science (prior to invention of quantum physics and relativity theory). In closed system approach which frame the traditional curriculum change in general is viewed undesirable. However, if change is inevitable it must be carefully controlled by external systems of assessment and evaluation that measure the 'deficit gap' between achievement and pre-set goal.

Basic premises of post-modern curricular thinking disagree with these principles. Recent studies e.g. in biology, chemistry, mathematics, management and sociology show that the prevalent state of systems is openness to influences, complexity of structures and constant change. Essential part of a curriculum is to find out methods of teaching and learning faithful to a changing context of natural and social conditions.

T. Autio, R. Jaakkola, & E. Ropo
University of Tampere
Dept. of Education
P O Box 607
33101 Tampere
Finland

Phone: +358 - 31 - 2156903
Fax: +358 - 31 - 2157502

Personal Career Plans Project

Cecil Holmes
Northern Ireland Curriculum Council, Northern Ireland

Introduction

In September 1992 six post-primary schools in Northern Ireland accepted an invitation to take part in a two year pilot initiative designed to develop Personal Career Plans with selected groups of pupils in Years 10-12 (age 14-16). Year 12 (age 16) is the final year of compulsory schooling when pupils reach the age of sixteen. The pilot programme is sponsored jointly by the Training and Employment Agency (T&EA) and the Department of Education for Northern Ireland (DENI). The pilot is due to end in August 1994.

Development work in each school is supported by an adviser from the two local Education and Library Boards within which the schools are located. The advisers work closely with the Careers Officers from the T&EA who offer advice and guidance on the development of the Personal Career Plans.

What is personal career planning?

Personal career planning is concerned with personal decision-making and planning at the times of transition when a range of options is available. It is a process which must be rooted in each pupil's self-awareness, including a knowledge of his/her academic abilities and achievements, and based on accurate information about particular occupations and trends in the labour market. Through this decision-making and planning process pupils will be developing skills such as information seeking, communication, target setting, organisation and reviewing.

The process of personal career planning progresses pupils through a number of overlapping stages which contribute towards their long term occupational goals (see Appendix 1). The outcomes of each stage should be carefully recorded. There will be a major input and continuous monitoring by the Careers Department in the school, with links to pastoral care, subject teachers, parents, and Careers Officers. Personal career planning should be pupil-centered and should empower the pupils to take charge of their future planning. This process, which is more important than the documentation, aims to help them to:

- make their own decisions;
- research information for themselves;
- take agreed action (action planning).

Principles

The construction of a Personal Career Plan should be guided by the following principles:

- pupils should work to a clear framework and timescale devised by Careers Department in the school as recommended in the attached flow-chart;

- it is essential that the careers guidance and advice offered to pupils should be both impartial and informed, and that pupils and careers teachers/careers officers should have a relationship based on mutual knowledge and trust; and
- the school should have a comprehensive range of up-to-date careers information which is easily accessible to all those who wish to use it.

Reasons for introducing the pilot initiative

The idea of Personal Career Planning has been given a high priority as the result of a range of circumstances and events. Some of these are set out below.

- As part of Northern Ireland's process of education reform, the educational (cross-curricular) theme of careers education is now incorporated within the statutory curriculum for Years 8-12 (12-16 year old). An earlier report, drawn up by a working group which was established by the then Minister with responsibility for education in Northern Ireland, published in 1990, set out proposals for the objectives for careers education. The report also recommended that pupils should be able to devise, maintain and implement a Personal Career Plan.
- DENI published a document entitled The Curriculum for 14-19 Year Old - A Framework for Choice in March 1992. In this publication, DENI states that career programmes should involve young persons in activities which enable them to research, plan and take decisions about their careers from a base of knowledge and understanding of the opportunities open to them (paragraph 6.3).
- Government has made its intentions clear in a range of public statements about a number of education and training issues:
    - increasing the range of vocational courses available for young people;
    - increasing the participants for students in full-time education after compulsory schooling;
    - funding arrangements for training are to be based on the qualifications achieved by the young people on completion of their training thus making it even more important for institutions to ensure that the students or trainees are following courses which are appropriate for them.

  In the context of Northern Ireland, it is felt that the implementation of Personal Career Plans in schools will have an influential impact on the successful realisation of these intentions.
- Records of Achievement are compulsory for all school leavers from June 1994. Records of achievement are intended to summarise to board range of young people's achievements including, for example, details of qualifications; information about activities and experiences such as work experience, interests and hobbies and a personal statements by the young people themselves. There is a close relationship between Records of Achievement and Personal Career Plans.

Expected outcomes of the pilot initiative

- The production of examples of documentation associated with Personal Career Planning which have been trailed by the pilot schools during the developmental phase.
- Identification of a range of school management systems which appear to be effective in supporting and coordinating the work of Personal Career Planning in schools.

- Realistic costing of the additional resources which will be required if Personal Career Planning is to be introduced to pupils in all post-primary schools in Northern Ireland.
- Identification of the most effective methods of linking the support agencies involved in educational and vocational guidance of young people in Northern Ireland.

Role of the Northern Ireland Curriculum Council in the Project

The Council has a two fold role in the project.

- A Professional Officer is Chairperson of the Steering Group which oversees the project.
- The Council has appointed a Project Officer who is carrying out an evaluation of the project as it is developing in each of the six schools. The main elements of the Project Officer's work includes:
  - research:
    researching available literature on Personal Career Planning and, if possible, identifying good practice in schools in the British Isles;
  - evaluation
    working closely with those involved in the project, to evaluate the developmental work in the pilot schools;
    drawing up and applying valid research instruments to evaluate the process of Personal Career Planning in the pilot schools;

Some early indicators of the outcomes

- Personal Career Planning has focused on vocational guidance at critical transition points. One dimension of the process is action planning by students. The action planning is a pupil managed process aiming to involve the pupils in taking more responsibility for their behavior and learning within the school. It is likely that the work of Personal Career Planning will highlight the implications of action planning for all aspects of the curriculum.
- The target pupils have shown evidence of greater motivation towards their studies since they see, more clearly, the relevance of their studies for post-16 opportunities.
- There is a much more effective and supportive partnership between the schools and the Careers Officers from the T&EA.
- Pupils have a more definite plan for what they intend to do when they reach the school leaving age.
- The amount of time required for individual interviews is causing some concern particularly when Personal Career Planning is made available for all pupils.

Future plans and timescale

The first draft of the evaluation report, taking account of research results, will be completed by the end of March. Continuing discussions will take place with all interested parties throughout the period March-June 1994. In the light of any other findings or suggestions, the report will be refined and edited during July and August.

The publication and dissemination is scheduled to take place during September/October.

C. Holmes
Northern Ireland
Curriculum Council
Stranmillis Road
Belfast BT9 5DY
Northern Ireland
Phone: +44 - 232 - 381414
Fax: +44 - 232 - 666573

Teachers and the Curriculum of Value Education Regarding Labor

Wiel Veugelers
University of Amsterdam, the Netherlands

Teachers and the curriculum

The curriculum that is taught in the classroom is not the formal curriculum as it is expressed in governmental curriculum documents or in textbooks. Teachers give their own interpretation to the formal curriculum (Goodlad, Klein & Tye, 1979; van der Akker, 1988). They give a personal significance to the curriculum and lay their own emphases on their 'pedagogical content knowledge', teachers construct their own curriculum (Shulman, 1987). Teachers are intellectuals who stress their own professional and personal views on education in their curriculum (Giroux & McLaren, 1989). Teachers' personal values have an influence on their curriculum. This influence is particularly great when teachers wish to develop certain values in their students.

Social-normative qualifications

Education fulfils various tasks in society. Its three principal tasks are personal development of students, socio-cultural education and socio-economic preparation. These educational tasks can be distinguished only analytically; in educational practice these tasks go together. The preparation of students for labor goes mainly together with their preparation for society. By preparing students for labor a contribution is also made to their personal development.

In preparing students for labor, teachers want to develop a qualification for labor. Concerning the required qualifications for labor, a distinction can be made between technical-instrumental and social-normative qualifications (Van Hoof & Dronkers, 1980). Social-normative qualifications are the values and habits people need for labor. Hurrelmann (1975) divides the social-normative qualification for labor in social-regulative, motivational-normative and politico-normative elements. In this study, the motivational-normative and politico-normative elements have been distinguished in the following themes: 'motives in occupational choice', 'social organization of labor' (division of labor and unemployment) 'labor relations' and 'relations between education and labor'. A social-normative qualification for labor can be aimed at personal adaptation, personal emancipation and collective emancipation.

Research design

In this study, we have investigated the relationship between school type, school subject and teachers' personal characteristics, on the one hand, and the importance teachers attach to different aims in the field of values related to labor, on the other hand. The research instrument was a written questionnaire in which teachers had to indicate on an interval scale how much importance they attached to each of the specified goals and how much attention they paid to each particular goal. Furthermore, they had to answer why they had chosen these goals. The questionnaire was sent to a random sample of secondary schools and to the commercial sectors of institutions for vocational training in the Netherlands. The school subjects comprised economics and practical subjects, social studies and career counselling. The questionnaire was sent to 694 teachers of which 415 (60%) responded. The statistical analyses used here are cluster analysis and analysis of variance (ONEWAY and ANOVA).

Results

Results show that teachers not only transfer knowledge and skills to their students but also stimulate the development of values related to labor in their students. Teachers' personal curriculum, their interpretation of the formal curriculum includes goals related to stimulating the development of values related to labor. Teachers wish to provide their students with specific values which are part of the 'pedagogical content knowledge' of the teachers.

The social-normative qualification for labor that all teachers in the investigated schools wish to give to their students can be summarized as the development of an individual who characterizes the transition from education to labor as follows: one's own effort, initiative and attitude determine one's school and professional career. One should attempt to achieve one's prospects and personal interests in choosing a certain occupation. One should also endeavour, as much as possible, to achieve an equal division of labor. Unemployment is mostly caused by social factors and not by personal ones. Showing a positive attitude with respect to entrepreneurship (industrial initiative) is also very important. One should not only stand up for oneself in one's work environment but he/she should also be able to adjust to the prevailing labor relations.

Interpretation of the curriculum

Analysis of documents on the formal level of the curriculum showed that in educational policy and national curriculum documents in the Netherlands no goals are set for values. Only recently, policy has enhanced the pedagogical task of education. But which values schools wish to develop in their students is not a responsibility of the Minister of Education, but of the schools themselves. Also, according to teachers in all school types, government policy and examination syllabus in the Netherlands have little influence on goal setting with respect to this topic. According to teachers in all school types, the importance they attach to certain goals is particularly determined by the educational task of the school, the future work situation of students and the view teachers have with regard to labor.

W. Veugelers
University of Amsterdam
Graduate School of Teaching and Learning
Herengracht 256
1016 BV Amsterdam
The Netherlands

Phone: +31 - 20 - 5253541/1256
Fax: +31 - 20 - 5253709

Curriculum Theory and Citizenship Education: a Case Study

Clem Adelman
University of Reading, England

The classical idea of citizenship as advocated by Plato, Mill, and Hegel entails clarification of rights and duties towards the concept of the State.

Curricula for citizenship education have been based on variations on a continuum from liberal individualism to subservience tot the State. In democracies the gap between rational planning and government has been painfully manifest particularly since the 1930s in Europe/ The modernity associated with the enlightenment has failed in most respects except in those museums of virtue - the schools where the curriculum celebrates rationalism. This presents problems for educator who are cognisant with the critiques of Habermas, MacIntyre and Giddens amongst the poststructuralists and the many postmodernists of who,m Lyotard is a key writer.

My paper considers the prospects for a European citizenship curriculum in the light of conflicting views on rationality and liberty and in the context of subsidiarity and the decisions of the European Court of Justice. I conclude with some alternative proposals upon which to base the development of a citizenship curriculum.

C. Adelman
Reading University
Fac. of Education
Woodlands ave
Reading Berks RG6 1UY
United Kingdom
Phone: +44 - 734 - 316658
Fax: +44 - 734 - 352080

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